The PHOTOFACT Servicer

SET 441 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ May 1, 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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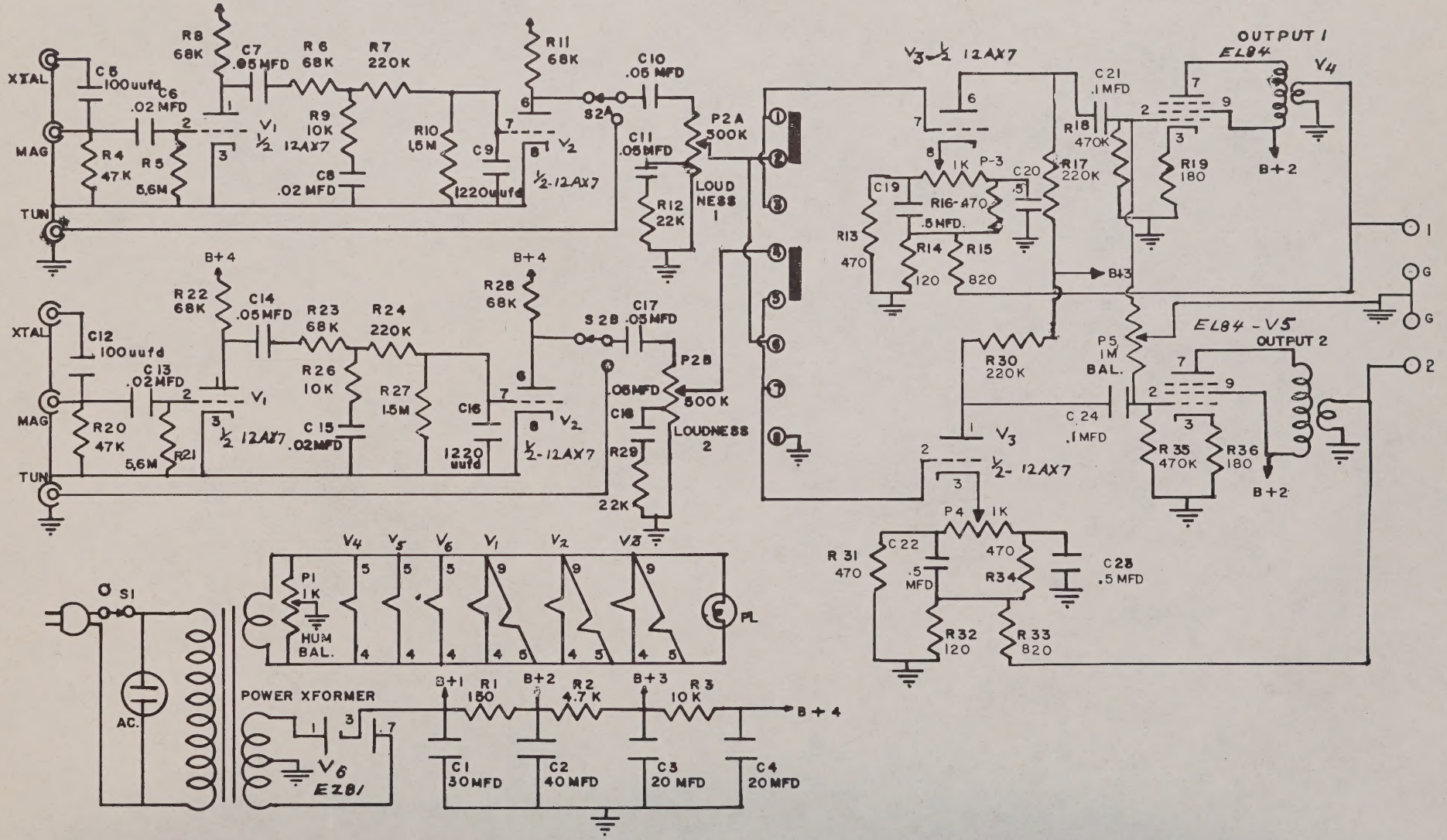
Radio Ch. 54-0100

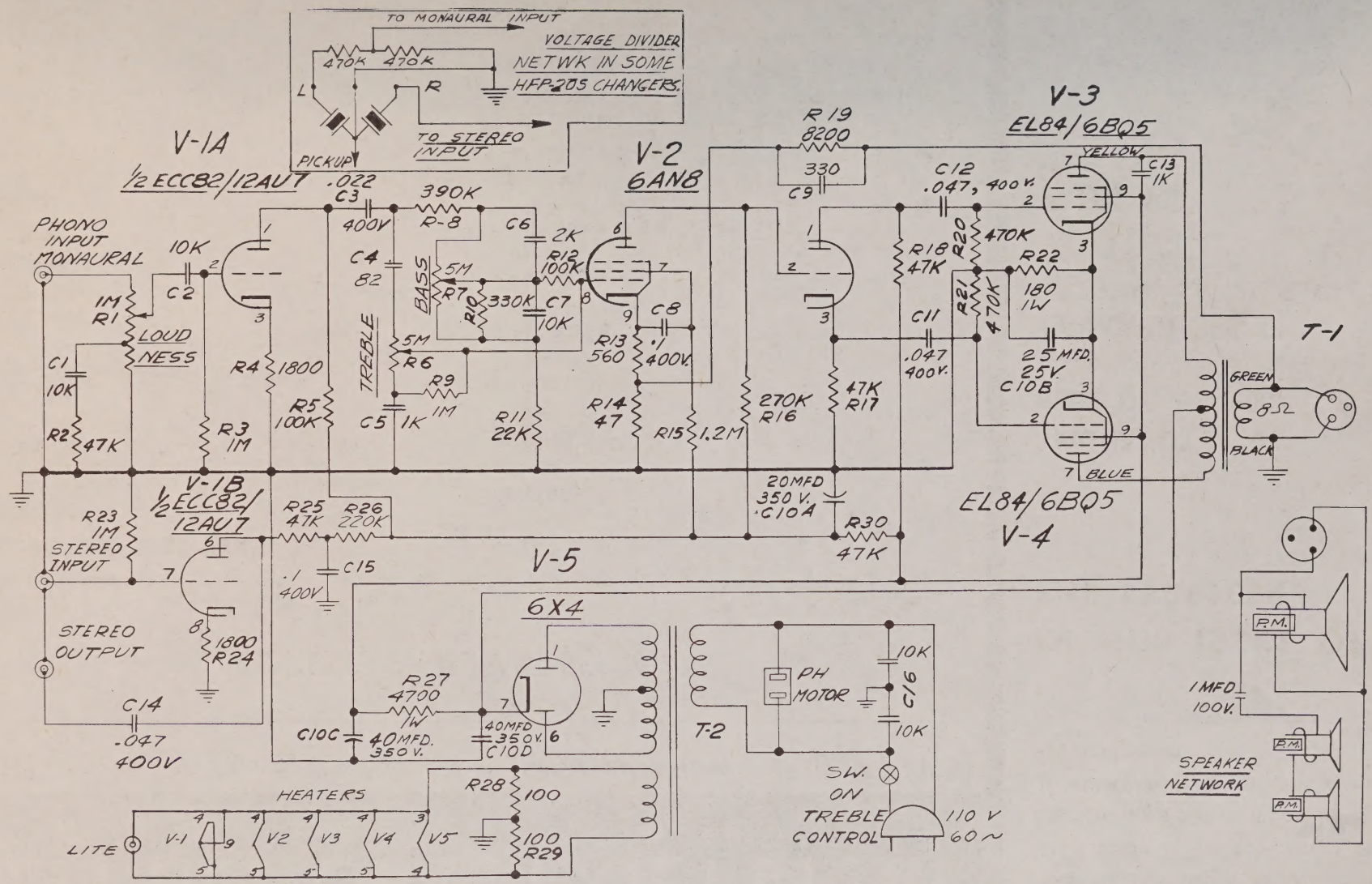
PACKARD-BELL
HFP-20S, SA-20, SAC-1
(Ch. PA-20)

PRECISE
Mark VII



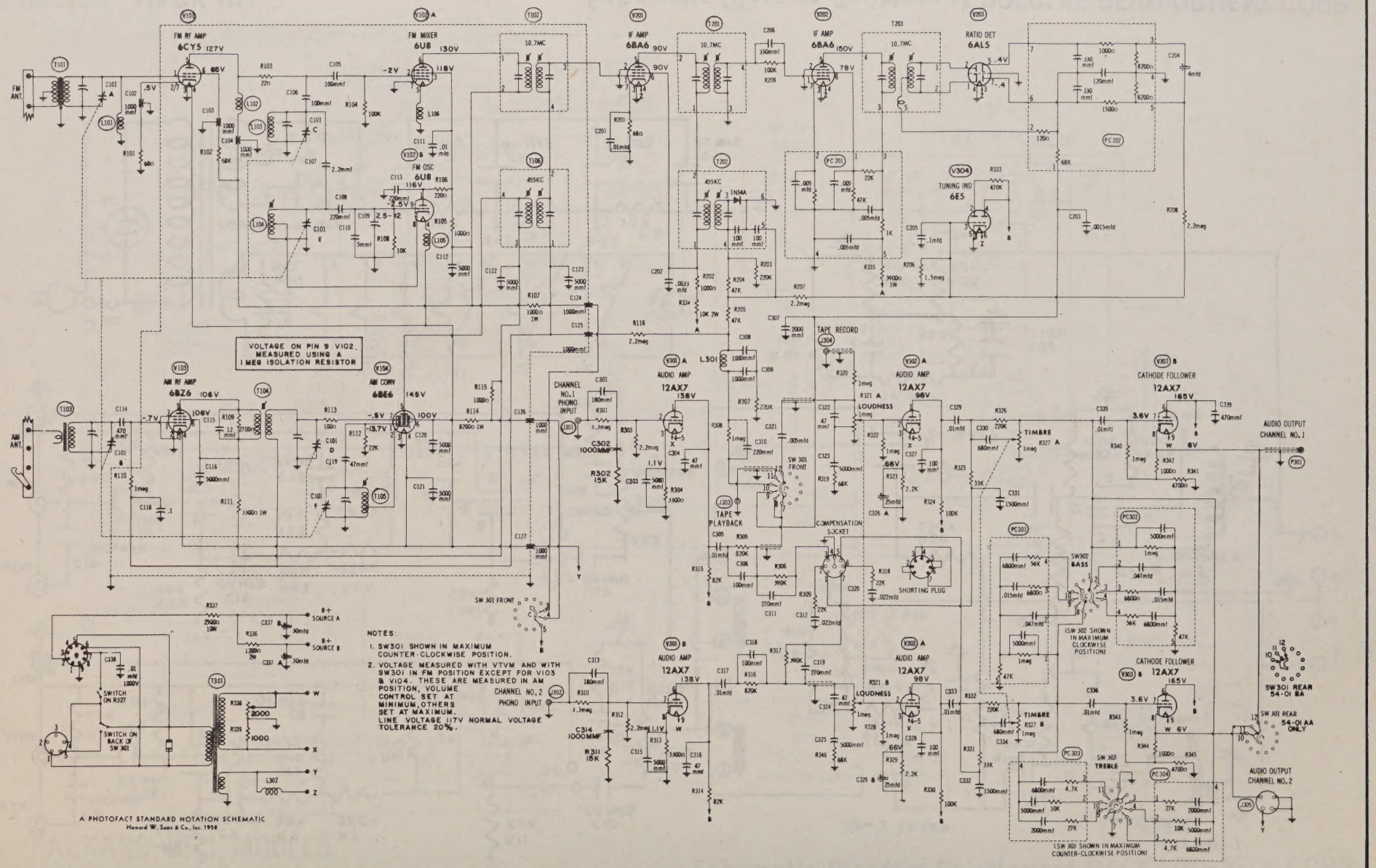
PRECISE MARK VII

Schematic Diagram Courtesy of PRECISE DEVELOPMENT CORP.



PACKARD-BELL MODELS
HFP-20S, SA-20, SAC-1 (Ch. PA-20)

Schematic Diagram Courtesy of PACKARD-BELL CORP.


VOLTAGE ON PIN 9 V102, MEASURED USING A 1 MEG ISOLATION RESISTOR
NOTES:
1. SW301 SHOWN IN MAXIMUM COUNTER-CLOCKWISE POSITION.
2. VOLTAGE MEASURED WITH VTVM AND WITH SW301 IN FM POSITION EXCEPT FOR V103 & V104. THESE ARE MEASURED IN AM POSITION, VOLUME CONTROL SET AT MINIMUM, OTHERS SET AT MAXIMUM. LINE VOLTAGE 117V NORMAL VOLTAGE TOLERANCE 20%.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

MAGNAVOX Radio Ch. 54-0100

Schematic Diagram Courtesy of MAGNAVOX CORP.

PHOTOFACT* Folder

*TRADE MARK

Howard W. Sams

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

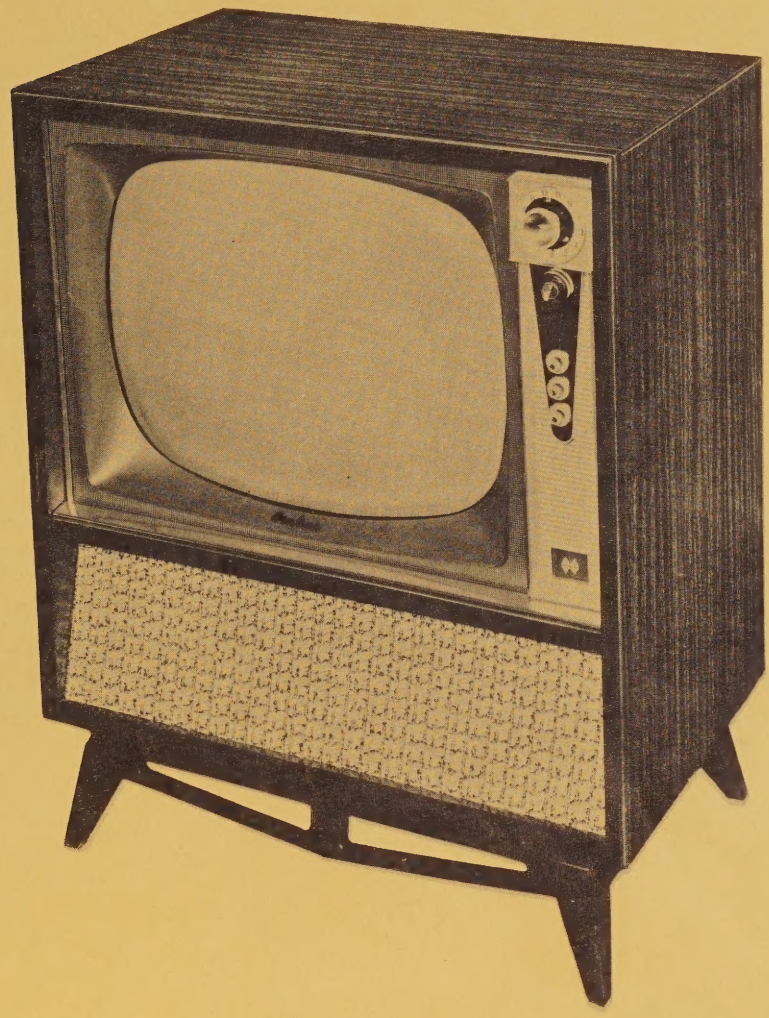
AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B



MODEL WG-5062A

AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

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DATE 5-59

SET 441 FOLDER 1

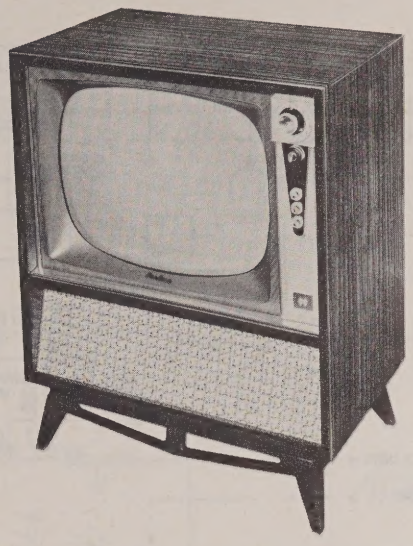
AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs.
2. Remove 6 wood screws holding rear cover. Remove the rear cover.
3. Remove speaker leads.
4. Remove 2 screws holding antenna terminal board.
5. Remove 2 wood screws holding top chassis braces.
6. On models having side mounted controls, remove 1 hex screw holding bracket to cabinet and hex screw painted red near Vertical Output transformer holding control panel. Swing control panel back into cabinet to clear shafts.
7. Remove 4 bottom chassis bolts.
8. Remove chassis.

SEE PICTURE TUBE REMOVAL PAGE 16



MODEL WG-5062A

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Airline MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B.
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois
TYPE SET	Television Receiver
TUBES	VHF-Fourteen, UHF-Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 160 Watts, 1.45 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT

For touch-up adjustment of the VHF Oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

SAFETY GLASS REMOVAL

Remove 5 wood screws holding metal trim strip at top of safety glass. Tilt top of glass out and lift up to remove.

RANGE CONTROL

Observe the picture and advance the Range control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

FOCUS

No provision is made to vary the focus on this receiver. (Some sets may be equipped with a Beam Alignment Magnet which may be adjusted for best focus.)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSE DEVICE

A 7.5Ω fusible resistor (R64) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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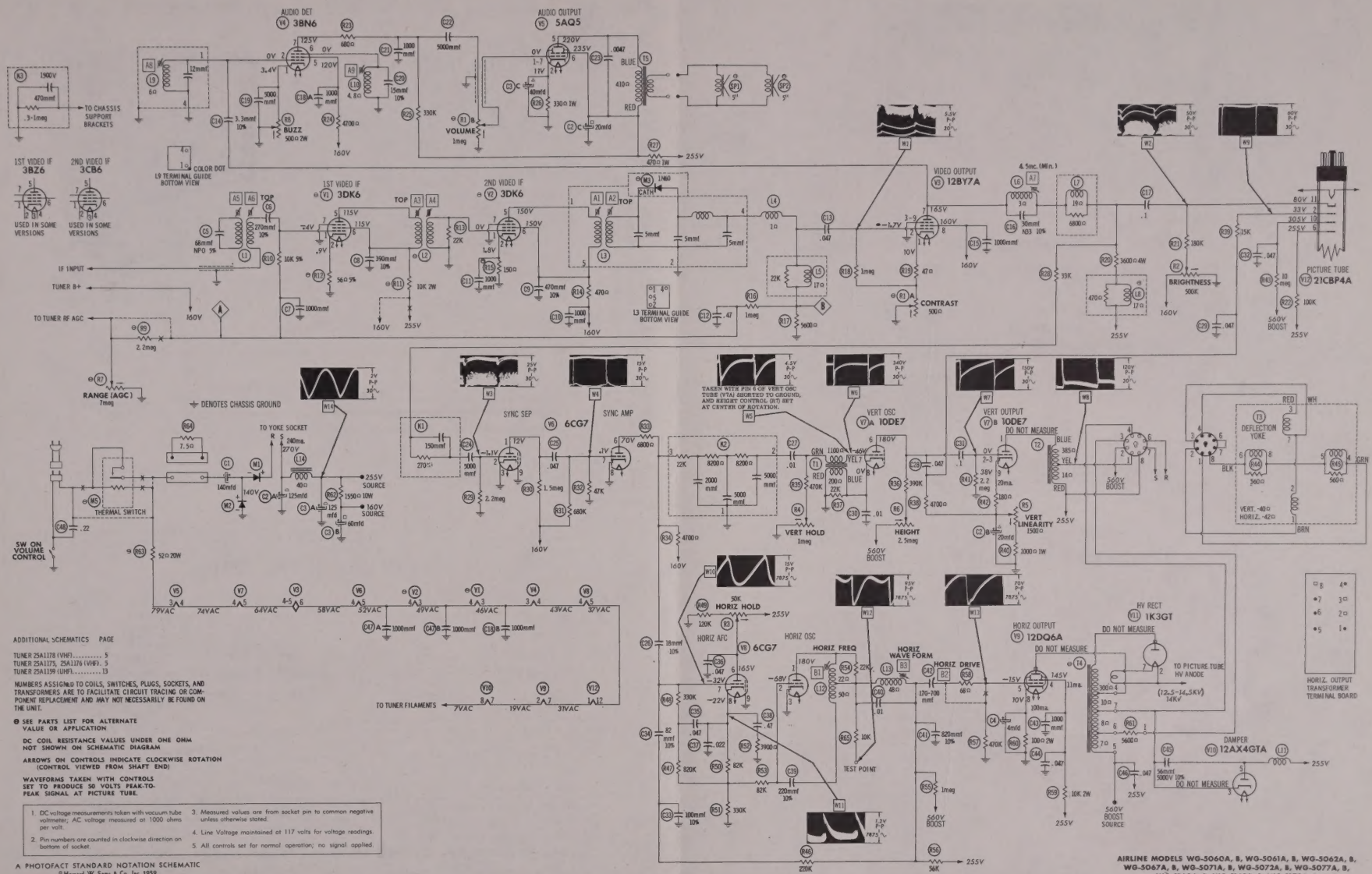
AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

SET 441 FOLDER 1



ADDITIONAL SCHEMATICS PAGE

TUNER 25A1178 (VHF)..... 5
TUNER 25A1175, 25A1176 (VHF). 5
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NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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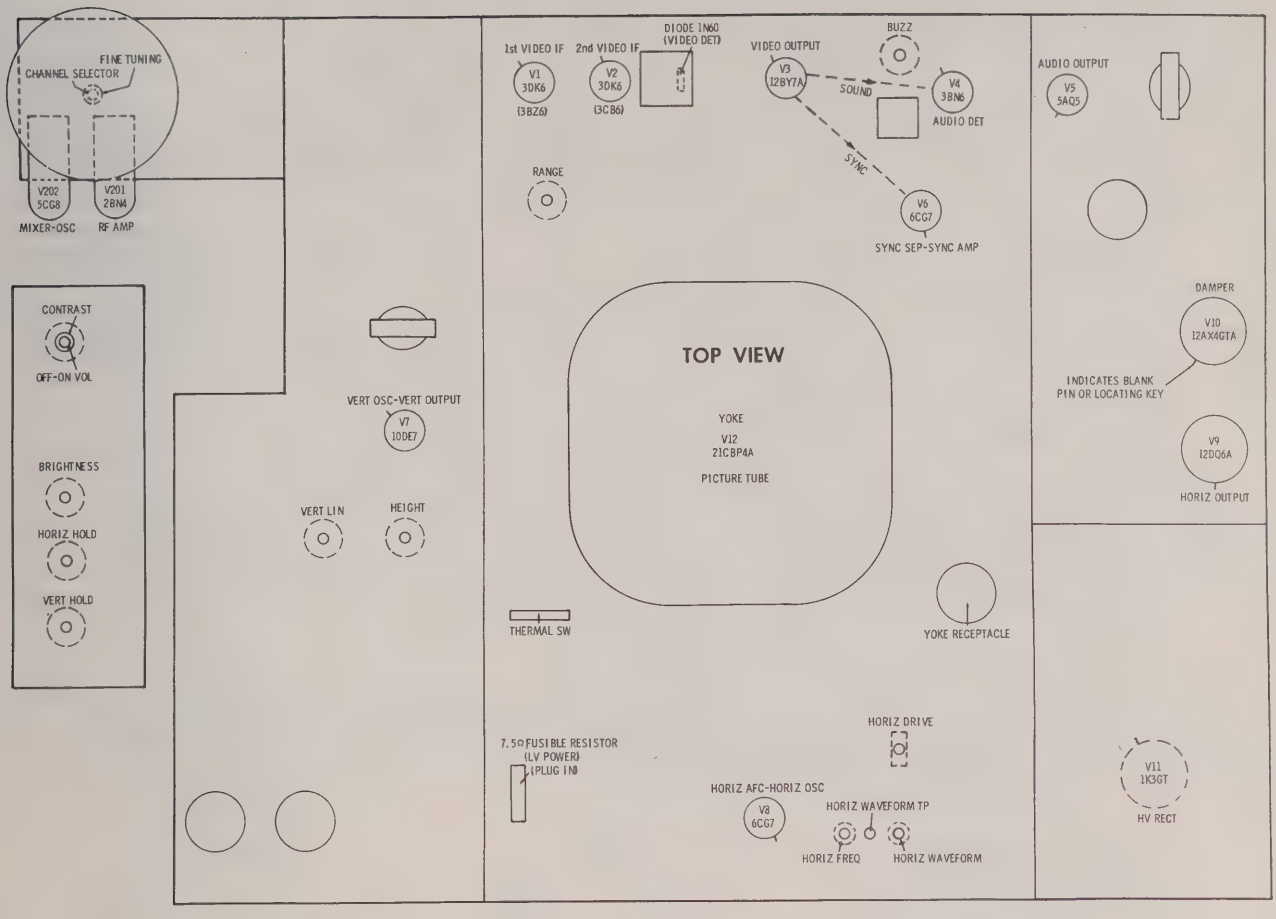
AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

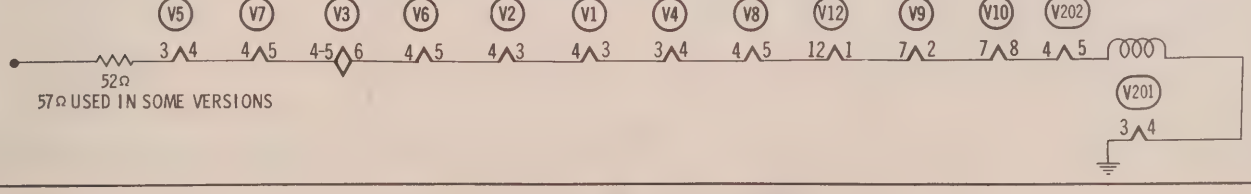
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (7.5Ω), Rectifier (B+)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12, Rectifier (B+)
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, Rectifier (B+)
Vert. off freq. V7
Horiz. off freq. V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V6, V8
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 543, 544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point Ⓐ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4VP-P on scope.	44.0MC (10MC Swp)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker position and A2 controls gain and symmetry.
2.	"	High side to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust for 4VP-P on scope.	"	42.4MC 43.5MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker position and A4 controls gain and symmetry.
3.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01mfd	High side to pin 2 (grid) of Video Output. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10V AC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz control (R8) for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjusting, further reduce the signal strength.

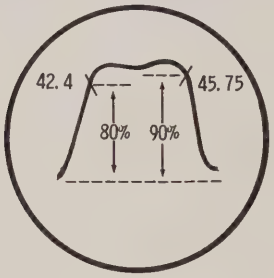


FIG.1

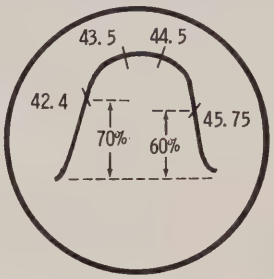


FIG. 2

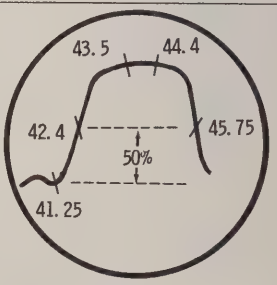


FIG. 3

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
B1, B3.... GENERAL CEMENT #8271, 8279
WALSCO #2524, 2527
B2 ..... 1/4" Nut Driver

Turn the Horizontal Hold fully clockwise. Tune in a station and adjust the Horizontal Frequency slug (B1) until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast fully counterclockwise and the Brightness clockwise so that the picture appears washed out. Turn the Horizontal Drive trimmer (B2) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of a scope to point Ⓒ . Low side to chassis. Adjust the Horizontal Waveform slug (B3) until the round and sharp peaks of the waveform are equal in amplitude. See Fig. 4. Keep the picture in sync during this adjustment.

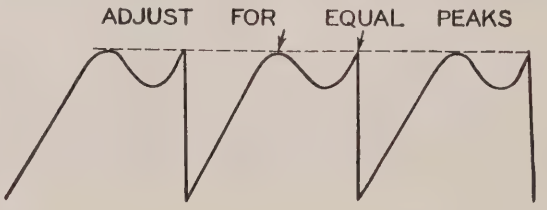
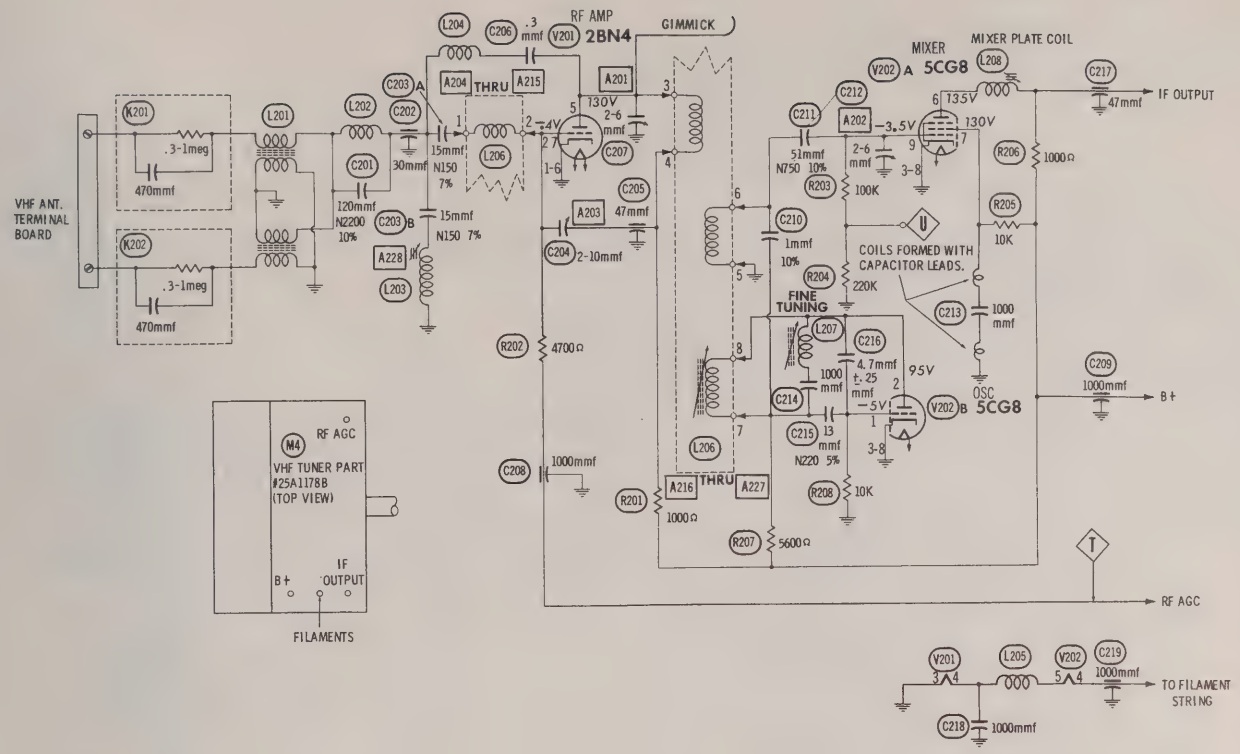


FIG. 4



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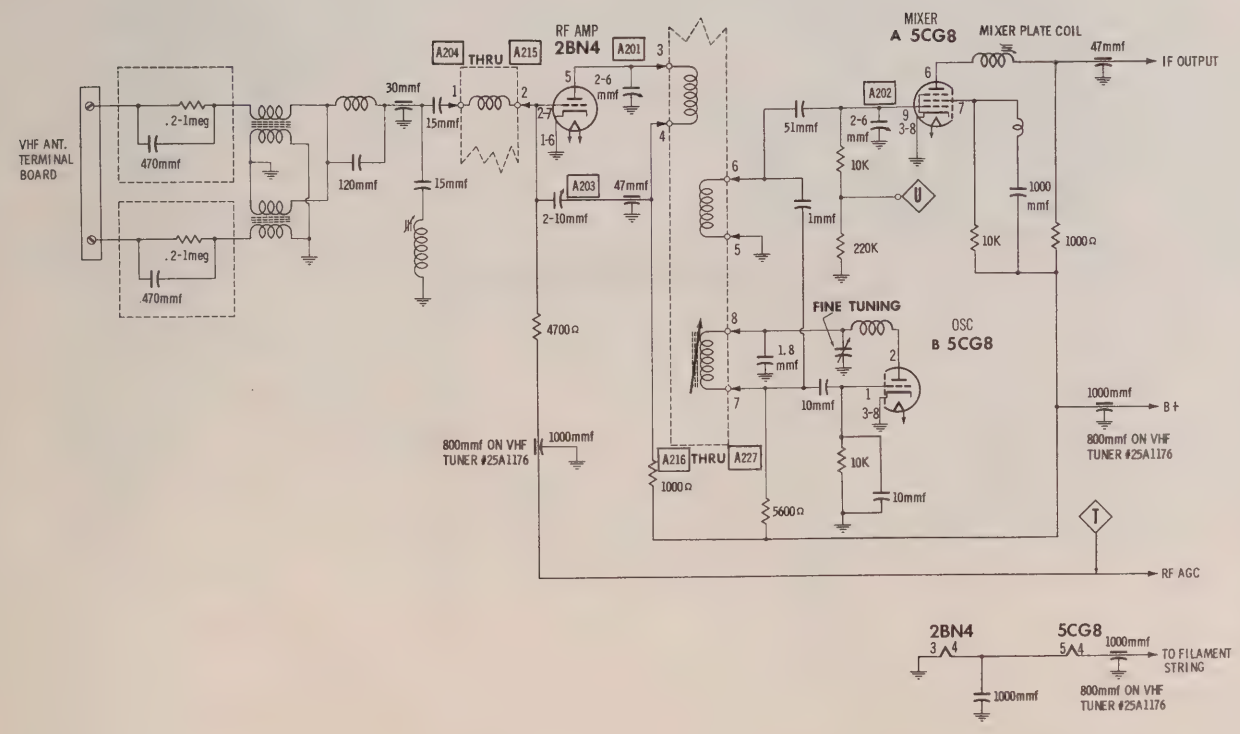
VHF TUNER 25A1178



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VHF TUNER 25A1175, 25A1176

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A201, A202, A203 .... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A228 ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope. Recheck A201.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

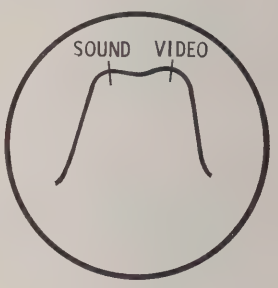


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect the negative lead of a 4.5 volt bias supply to point Ⓣ. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

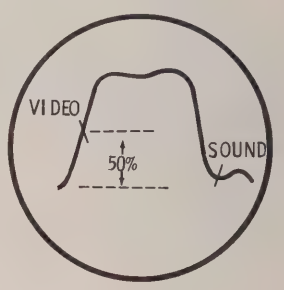


FIG.202

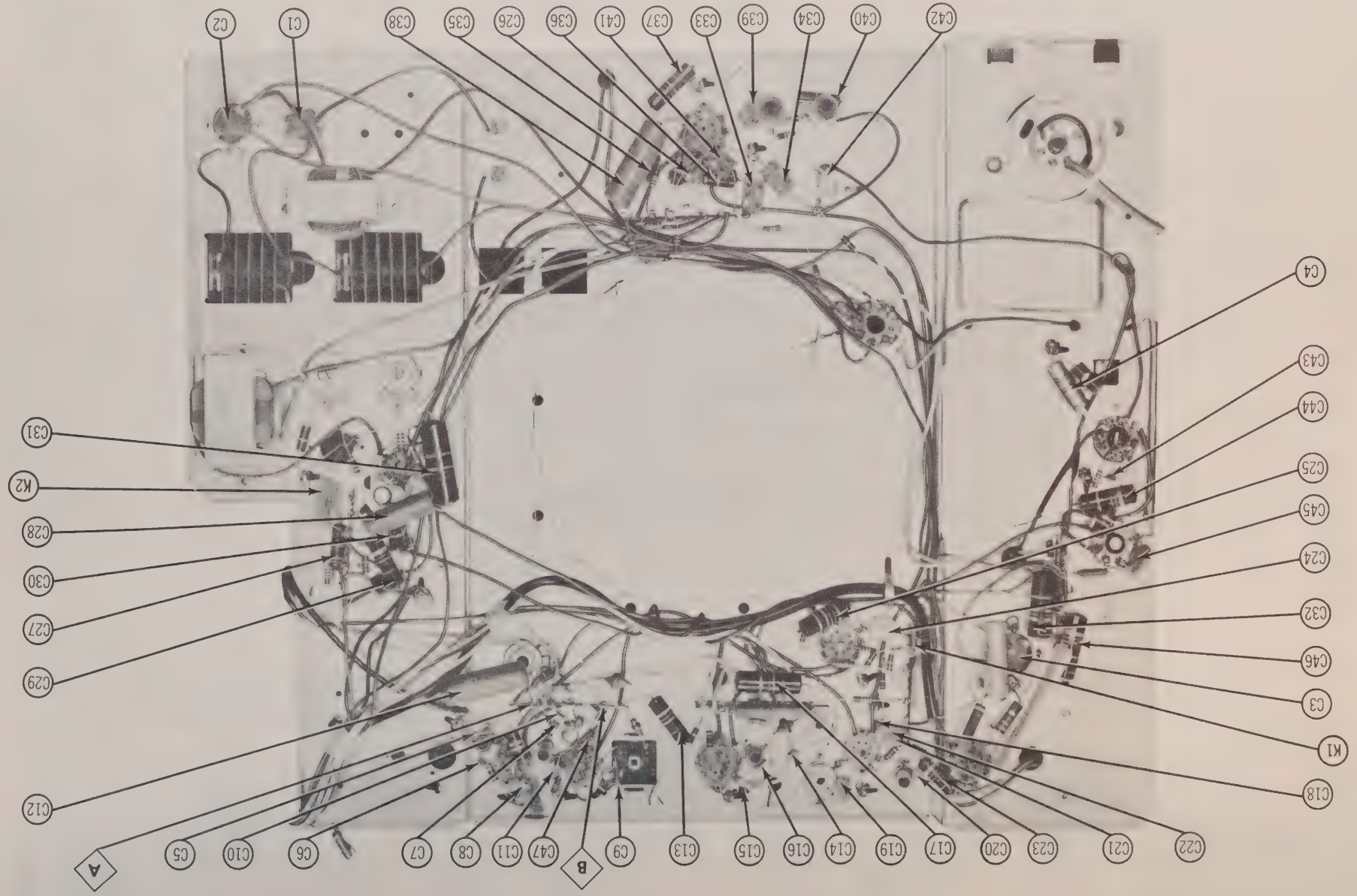
UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

TRAP ADJUSTMENT

Some types of interference may be reduced by adjusting A228. Tune in the channel where interference occurs and adjust A228 for MINIMUM interference while observing the picture.

CHASSIS BOTTOM VIEW - CAPACITOR & ALIGNMENT IDENTIFICATION



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	3DK8	3BZ6 *
V2	2nd Video IF Amp.	3DK8	3CB6 *
V3	Video Output	12BY7A	
V4	Audio Det	3BN6	
V5	Audio Output	5AQ6	
V6	Sync Sep.-Sync Amp.	6CG7	
V7	Vert. Osc.-Vert. Output	10DE7	
V8	Horiz. AFC-Horiz. Osc.	6CG7	
V9	Horiz. Output	12DQ6A	
V10	Damper	12AX4GTA	
V11	HV Rect.	1K3GT	

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: AIRLINE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V12	21CBP4A	21ETP4 ①	21CBP4-A ②	21CBP4/ 21CBP4A ③	① "Aluminized" Add Ion Trap. ② "Silverama". ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	140	150	45X421	AFH51-23	XA0261	FP117	TMS-24	TVL-1428	
C2A	125	300	45X431	AFH402-60	XC0733.2	FP218			
B	20	300				TC36			
C	20	50							
C3A	125	300	45X420	AFH3-99-82	C0733.7	FP330.27		TVL-3574.6	
B	60	300							
C	40	50							
C4	4	50	45X418	PRS150V4	BBR4-50	TT50X4	TD-4-50	TVA-1402	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	TOL	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	68		NPO 5%		NPO-DI 68	DTZ-68	C0Q68C	CNO-468	5TCC-Q68S 5%	
C6	270		10%		DI 270	MD-271	L10T27		5GA-T27S 10%	
C7	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C8	390		10%		DI 390	MD-391	L10T39		5GA-T39S 10%	
C9	470		10%		DI 470	MD-471		JL-347	5GA-T47S 10%	
C10	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C11	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C12	.47	200			P288N-47		CUB2P47	GEM-2047	2TM-P47	
C13	.047	200			P488N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C14	3.3		10%		NPO-SI 3.3	TCZ-3R3	C10V33C	CNO-533	5TCCB-V33S 10%	
C15	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C16	30		N33 10%							
C17	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C18A	1000			80X3	BPD-XX001	DD3-102	BYD6DD1	B-210	5HK-XD1	
B	1000							B-210		
C19	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C20	.15		10%		DI 15	DD-150	L10Q15	CNO-415	5TCC-Q15S 10%	
C21	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C22	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C23	.0047	600			P688N-0047	DB-472	CUB6D47	GEM-6247	6TM-D47	
C24	5000				BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C25	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C26	18		10%	RCM20B180K	1469-000018	TCZ-18	22R5Q18	CNO-418	MS-418	
C27	.01	400			P488N-01	DF-103	CUB4S1	GEM-411	4TM-S1	
C28	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C29	.047	300			P388N-047	DF-503	CUB3S47	GEM-4147	3TM-S47	
C30	.01	400			P488N-01	DF-103	CUB4S1	GEM-411	4TM-S1	
C31	.1	600			P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C32	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C33	100		10%		1469-0001	TCZ-100	22R5T1	MCB235	MS-31	
C34	82		10%	RMC30B820K	1469-000083	TCZ-82	22R5Q82	CNO-482	MS-482	
C35	.047	300			P388N-047	DF-503	CUB3S47	GEM-4147	2TM-S47	
C36	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C37	.022	300			P388N-022		CUB3S22	GEM-4122	2TM-S22	
C38	.47	300			P288N-47		CUB2P47	GEM-3047	2TM-P47	
C39	220		10%		1469-00022	TCZ-220	22R5T22		MS-322	
C40	.01	400			P488N-01	DF-103	CUB4S1	GEM-411	4TM-S1	
C41	820		10%	RCM20B821K	1464-00082		1R5T82		MS-382	
C42	170-700			17A271						
C43	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C44	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C45	56	5000	10%	47X755						
C46	.047	600			P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C47A	1000			80X3	BPD-XX001	DD3-102	BYD6DD1	B-210	5HK-XD1	
B	1000							B-210		
C48	.22	400			P488N-22		CUB4P22	GEM-4022	4TM-P22	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	78X30	F1-2	RTV-646			Contrast , Note 1
B	1meg	½		R2-51	Not Req.	† QJ-1074	†† UE378BS	Volume
C	Switch			KR-1	Not Req.			Power Off-On
R2A	500K	½	40X423	B-59	A47-500K-S	QII-133	TA55L	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	50K	½	40X424	B-31	A47-50K-Z	QII-123	TA54L	Horiz. Hold
B	Shaft			Not Req. -	FS-3	Not Req.	Not Req.	
R4A	1meg	½	40X425	B-69	A47-1meg-S	QII-197	TA81L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1500Ω	½	40X399	AB-8	A47-1500-S	QII-109	PTA15ZL	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6A	2.5meg	½	40X398	BX-63	A47-2.5meg-S	QII-239	PTA25L	Height
B	Shaft			Not Req.	RN-3	TQ	Not Req.	
R7	7meg	½	40X455					Range (AGC) , Note 2
R8	500Ω	2(WW)	40X397		39-500		FL-600	Buzz

† "Concentrikit" Equivalent: K-2 Kit with Base Elements & Shafts: Bll-105, P6-102 (Panel), Bll-137, Rl-126(Rear), 76-1(Switch)
†† "ITA-LOC" Equivalent: FA75lL, OF125A, RU16l, EH675, U8-4l.
Note 1. Some versions may use 750Ω in this application with same part number.
Note 2. Not used in Models WG-5060A, B, 5061A, B, 5071A, B, 5160A, B.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	AIRLINE PART No.	NOTES
R9	2.2meg		B84225	Note 1
R10	10K 5%			
R11	10K	2W		Note 2
R12	56Ω 5%			Note 3
R13	22K			
R14	470Ω			Note 4
R15	150Ω			
R16	1meg			
R17	560Ω			
R18	1meg			
R19	47Ω			
R20	3800Ω	4W	43X331	
R21	180K			
R22	100K			
R23	680Ω			
R24	4700Ω			
R25	330K			
R26	330Ω	1W		
R27	470Ω	1W		
R28	33K			
R29	2.2meg			
R30	1.5meg			
R31	680K			
R32	47K			
R33	6800Ω			
R34	4700Ω			
R35	470K			
R36	390K			
R37	22K			
R38	4700Ω			
R39	15K			
R40	1000Ω	1W		
R41	2.2meg			
R42	180Ω			
R43	10meg			
R44	560Ω			
R45	560Ω			
R46	220K			
R47	820K			
R48	330K			
R49	120K			
R50	82K			
R51	330K			
R52	3900Ω			
R53	82K			
R54	22K			
R55	1meg			
R56	56K			
R57	470K			
R58	68Ω			
R59	10K	2W		
R60	100Ω	2W		
R61	5600Ω			Note 5
R62	1550Ω	10W		
R63	52Ω	20W		
R64	7.5Ω			
R65	10K			

Note 1. Not used in some versions.
Note 2. Some versions may use 470Ω in this application.
Note 3. Some versions may use 47Ω 5% in this application.
Note 4. Some versions may use 150Ω in this application.
Note 5. Some versions may use 57Ω 10W in this application.

COILS (RF-IF)

ITEM No	USE	AIRLINE PART No.	REPLACEMENT DATA: Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	1st Video IF	9A2436					① Includes 30 microhenries Resonant choke
B	41.25MC Trap						30 Microhenries
L2	2nd Video IF	9A2444					290 Microhenries, wound
L3	3rd Video IF	9A2435					on 22K resistor
L4	Resonant Choke	9A2375					
L5	Shunt Peaking Coil		19-3300 ▲	TV-199 ▲	6155 ▲		
L6	4.5MC Trap	9A2366	20-1004	TV-161	1469 ♦	SF-3	
L7	Series Peaking Coil	36A38	19-4400 ▲	TV-180 ▲	6132 ▲	VP-7 ▲	350 Microhenries, wound on 6800Ω resistor
L8	Shunt Peaking Coil		19-3300 ■	TV-199 ■	6155 ■		290 Microhenries, wound on 470Ω resistor
	Shunt Peaking Coil	36A38	19-4201 ■	TV-197 ■	6154 ■		220 Microhenries, wound on 470Ω resistor ②
L9	Sound IF	9A2434	17-1026				
L10	Quadrature Coil	9A2367	20-1005	TV-121	1480		
L11	RF Choke	9A2380	19-1001	BC-562	4604		1 5 Microhenries

① Some versions may use Part #9A2390 in this application.
② Alternate part used in some versions.
▲ Parallel with 22K resistor. ♦ Disregard tap.
■ Parallel with 6800Ω resistor. ■ Parallel with 470Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AIRLINE PART No.	Meissner PART No	Merit PART No	Miller PART No.	Ram PART No	Thordarson PART No.	NOTES
L12	72Ω		9A2371		TV-165	6211 *		HS-7	Horiz. Freq. tapped @ 50Ω
L13	48Ω		9A2372			6315		HS-5 *	Horiz. Waveform
									* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 (~)	REPLACEMENT DATA: AIRLINE PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No.	Triad PART No
L14	.260A	40Ω	1 Hy.	52X95-9	C5037 ①	C-2991 ①		C-2326 ①	26C43 ①	C-27X

① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	AIRLINE PART No.	REPLACEMENT DATA: Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No	Stancor PART No	Thordarson PART No.	Triad PART No
T1	Vert. Osc.	54X09	B6702	A-3003	V405	VB019	A-8125	26A03	A-97X
T2	Vert. Output	51X185-2	21B00 ①②	A-2855	V307 ① ③	VO28 ①	A-8113 ①	26S73 ③	A-118X ②③
T3	Yoke-Horiz.(34MB) (90°)-Vert. (39MH)	9A2403 ④	DF610 ⑤⑥	MDF-92 ⑤⑥⑦	Y90F19/43 ⑤⑥		DY-16A ⑤⑥⑦	Y-16 ⑤⑥	Y-45 ⑥ NW21 ⑤
	Rear Cover & Centering Device	9A435							YC-1
	Yoke Retainer	8X247							CL-1
	Yoke Clamp	30X611							
T4	Horiz. Output	53X362G	FB486 ③	HVO-157 ③ * §	X174	EFR188 ③ ⑦ * §	HO-283 *	FLY-143 ③ * §	D-121 *
	Alt. Horiz. Output	53X362							

① Connect as autoformer.
② Use 8 : 1 turns ratio.
③ Drill new mounting hole(s).
④ Includes resistors (R44, R45).
⑤ Use original rear cover and centering device.
⑥ Connect same as original.
⑦ Remove Horizontal Damping Network from yoke.
⑧ Trim 1½" from top of terminal board.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	5	5		5	8	4	4
	7	2	2		2	3	8 & 7	3
	6	6	6		6	2	2	2
	5	1	1		1	1	5	1
Special Notes →		⑨	⑨		⑨			⑨

⑨ Remove one turn from filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No.	Triad PART No	NOTES
TS	6100Ω	3-4Ω	51X185	Z1110	A-3026	AU-602 ①	A-3877 ①	24S51 ①	S-6X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: AIRLINE PART No.	QUAM PART No	NOTES
SP1	5"	PM	6-8Ω	12A550 ①	5A15Z8.6 ①	① Connect in parallel and phase Models WG-5062A, B, 5072A, B, 5077A, B, 5162A, B, 5172A, B
SP2	5"	PM	6-8Ω	12A550 ①	5A15Z8.6 ①	
	5"	PM		12A527 ②		② Models WG-5060A, B, 5061A, B, 5071A, B, 5160A, B

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No	REPLACEMENT DATA	
K1	Sync Coupling	150mmf, 270K	76X15		
K2	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 6200Ω, 8200Ω	76X7	Aerovox	PA-110
				Centralab	PC-100
				Cornell-Dubilier	115TMI
				Sprague	V-1/V-3
K3	Chassis Isolation	470mmf ⑧ 1500V, .3-1meg	76X11	Centralab	RC-47
				Sprague	ACI-1

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: AIRLINE PART No.	FEDERAL PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No.	NOTES
M1	.240A	66X14 ①	1236AH ①	T300 ①	300 ①	① Selenium Type
			HA504 ②	TV500 ②	40K ②	② Silicon Type
M2	.240A	66X14 ①	1236AH ①	T300 ①	300 ①	
			HA504 ②	TV500 ②	40K ②	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	CBS PART No.	SYLVANIA PART No	NOTES
M3	1N60 *		1N60	1N60	Video Detector (Pigtail) * Some versions may use CK706 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Tuner	25A-1178B	VHF
	Tuner	25A-1175	VHF
	Tuner	25A-1178	VHF
	Tuner	25A-1159	UHF
M5	Thermal Switch	2A494-B	Not used in Models WG-5060A, B, 5061A, B, 5071A, B, 5160A, B
	Magnet	2A494	Beam Alignment, may be used to improve focus

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

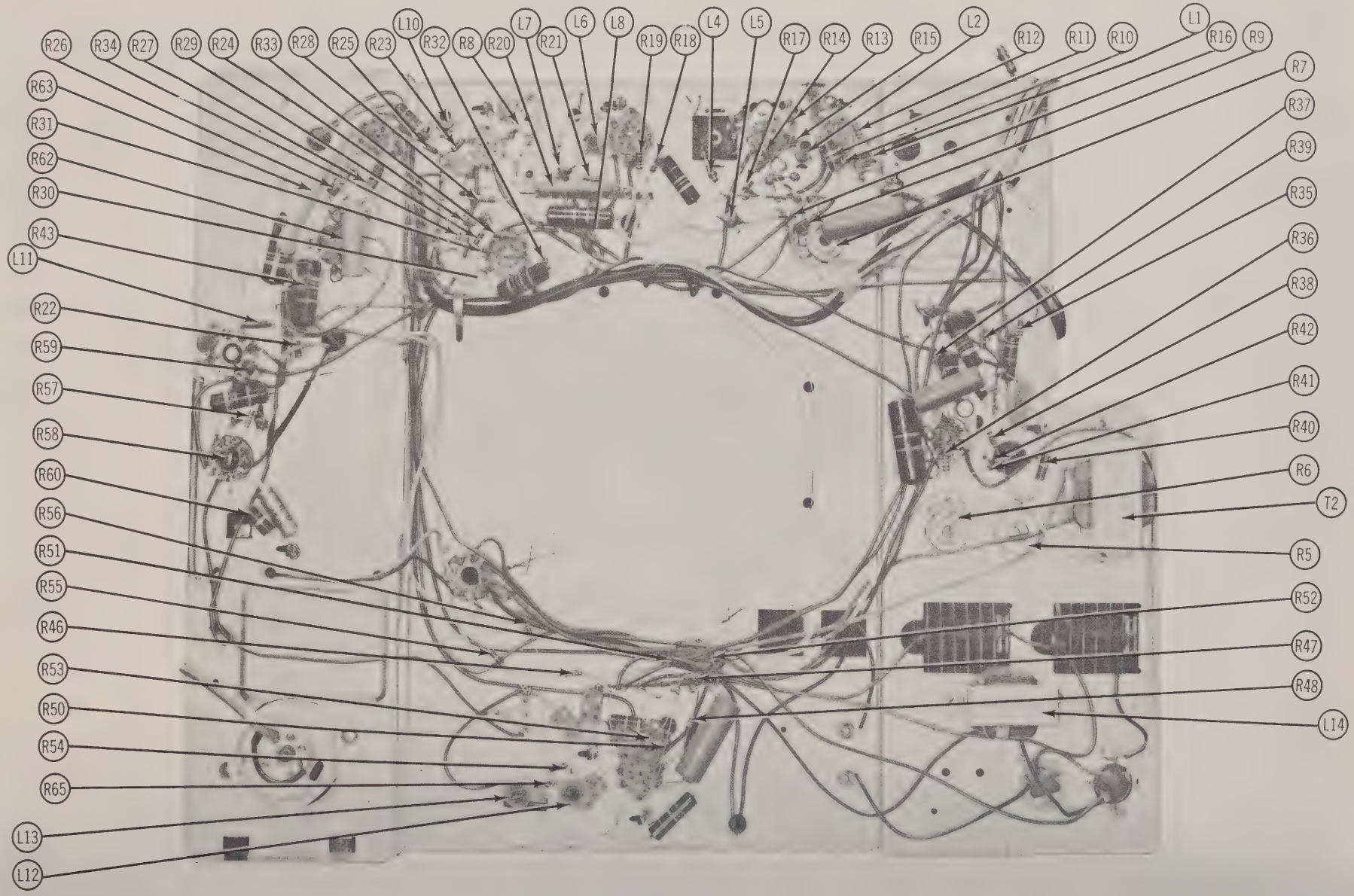
NAME	PART NO	DESCRIPTION
Safety Glass	17X199-1	Models WG-5061A, B, 5062A, B, 5067A, B, 5071A, B, 5072A, B, 5077A, B, 5162A, B, 5172A, B
Safety Glass	17X195	Models WG-5060A, B, 5160A, B
Mask Assembly	S-38A756	Gold, VHF Models
Mask Assembly	S-38760	Silver, VHF Models
Mask Assembly	S-38A761	Gold, VHF-UHF Models
Mask Assembly	S-38A831	Silver, VHF-UHF Models
Mask Assembly	S-38A751	Models WG-5060A, B, 5160A, B
Mask Assembly	S-38A641	Models WG-5061A, B
Mask Assembly	S-38A647	Models WG-5071A, B

WIRING DATA

High Voltage Lead	Use BELDEN No. [illegible]
Shielded Hook-up Wire	Use BELDEN No. 8585 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. [illegible]
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8464 (Round) - 4 Conductor 8465 (Round) - 5 Conductor 8468 (Round) - 8 Conductor

AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

FOLDER 1



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

25A1178

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		N2200 10%	13L-031						
C202	30			13M420U300J-01						
C203A	15		N150 7%	13L8PG150N2						
B	15									
C204	2-10			31B-206-08		829-10				
C205	47			13M130U470J-01						
C206	.3			13D-111-42						
C207	2-6			31B-206-01		829-6				
C208	1000			13M420EA102Z-01	EF-1000	MFT-1000				
C209	1000			13M420EA102Z-01	EF-1000	MFT-1000				
C210	1.0		10%	13D-111-35	NPO-SI 1.0	TCZ-1.0		CNO-510	5TCCB-V1S 10% *	
C211	51		N750 10%		N750-DI 51	TCZ-51	C10Q51U		5TCU-Q51S 10% *	
C212	2-6			31B-206-01		829-6				
C213	1000			3LJ-024	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C214	1000			13L6X102Z	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C215	13		N220 5%	13L8R130J						
C216	4.7		±.25mmf	13L8R4R7C				CNO-547	5TCCB-V47S ±.25mmf*	
C217	47			13M420Q470J-01						
C218	1000			13L6X102Z	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C219	1000			13M420EA102Z-01	EF-1000	MFT-1000				

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R201	1000Ω			
R202	4700Ω			
R203	100K			
R204	220K			

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R205	10K			
R206	1000Ω			
R207	5600Ω			
R208	10K			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .3-1meg	13P-198-02	Centralab Sprague	RC-471 AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	13P-198-02	Centralab Sprague	RC-471 AC1-1

NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-3397	†
L202	IF Trap Coil	34A-748	†
L203	IF Trap Coil	34A-762	
L204	RF Choke	34A-1005	
L205	Fil. Choke	31K-137-027	

ITEM No.	USE	PART No.	NOTES
L206	Ant, RF, Mixer Grid & Osc. Coils	31T-3361-07	Includes Rotor Disc Assy.
L207	Fine Tuning Coil	34A-787-03	
L208	Mixer Plate Coil	31UA-580-017	

† Part of M201. NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

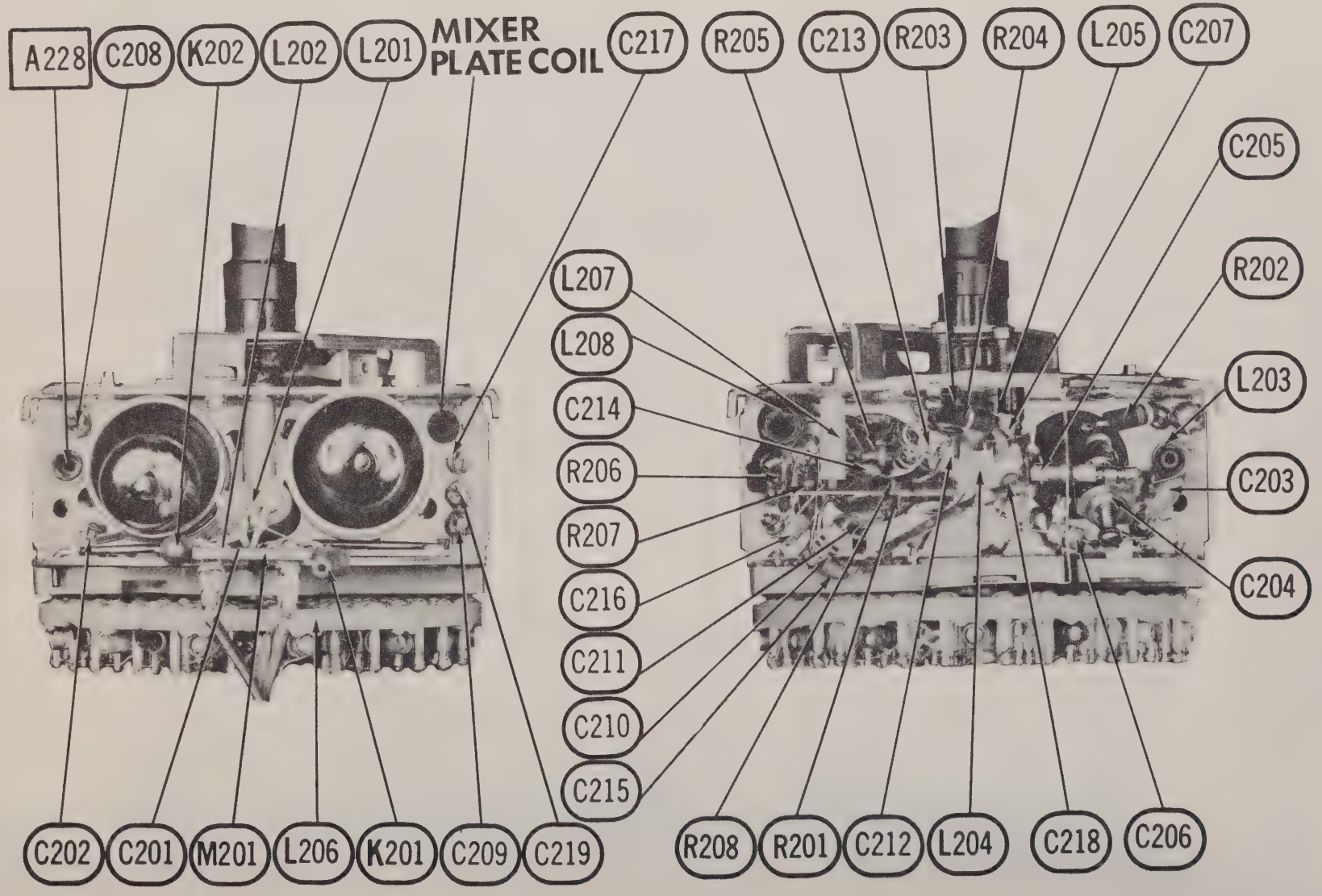
MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M201	Antenna Input Assy	31T-3398-02	Includes C201, L201, L202, K201 and K202
	Retaining Spring	23A-172	
	Locking Spring	23A-131	
	Contact Spring	23A-132-02	
	Detent Spring	23A-145	
	Oscillator Slug	9E-501-01	

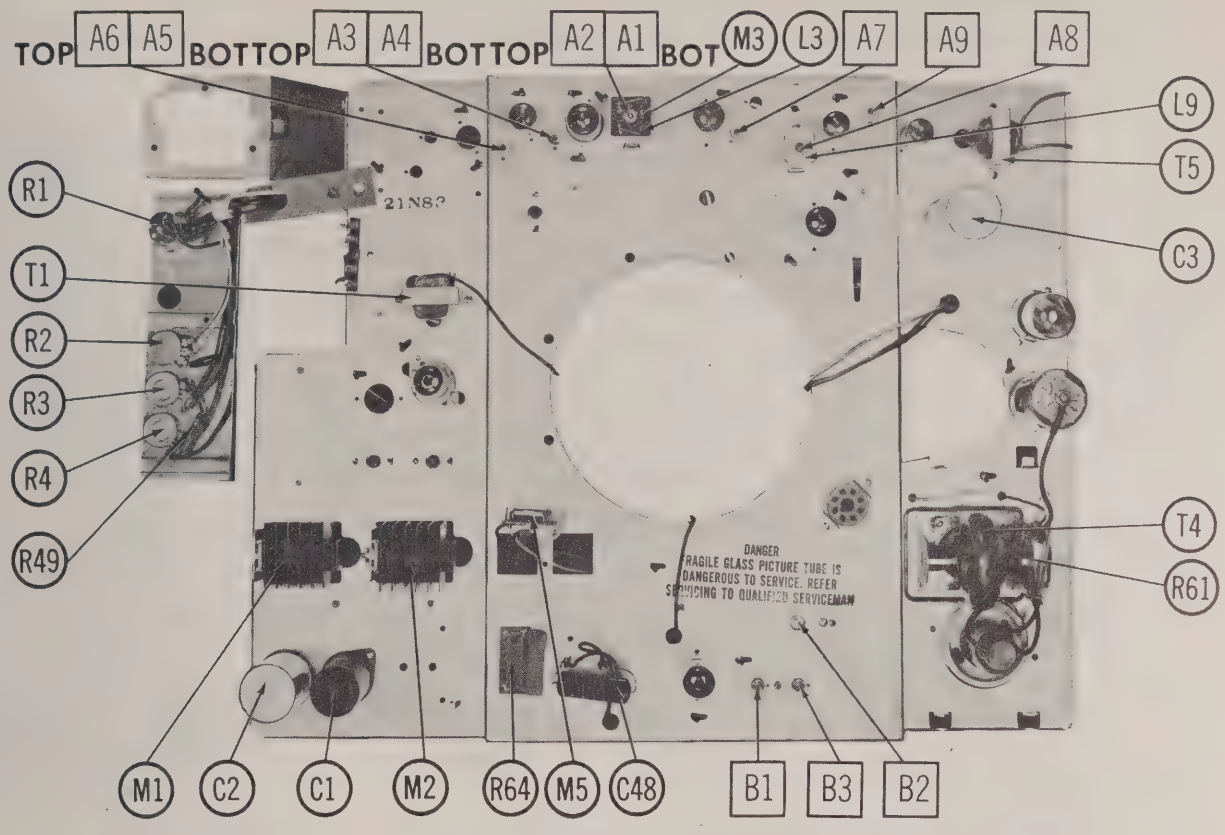
NOTE: Part numbers listed above are "Standard Coil" Part Numbers.

AIRLINE MODELS WG-5060A, B, WG-5061A, B, WG-5062A, B, WG-5067A, B, WG-5071A, B, WG-5072A, B, WG-5077A, B, WG-5160A, B, WG-5162A, B, WG-5172A, B

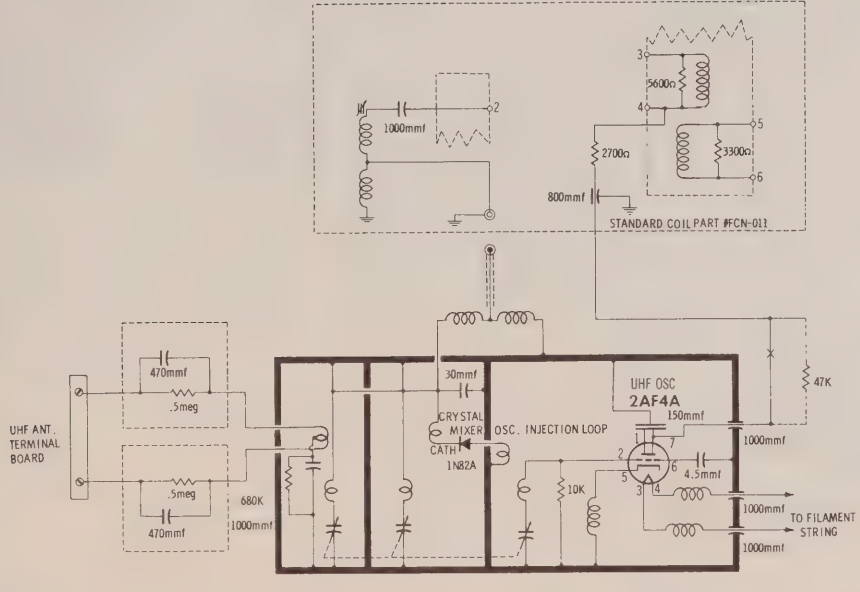
FOLDER 1



TUNER 25A1178



CHASSIS - TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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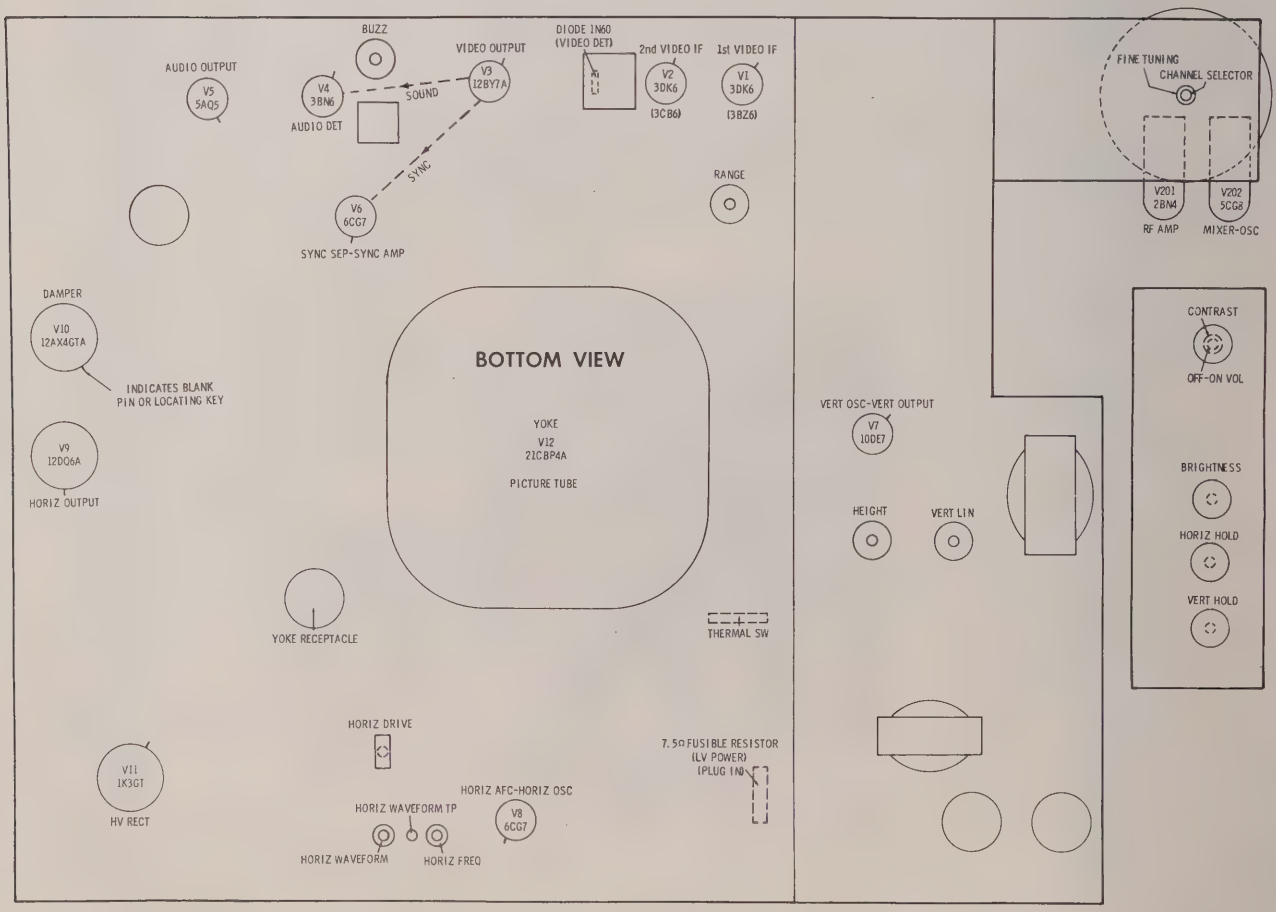
UHF TUNER 25A1159

RESISTANCE MEASUREMENTS

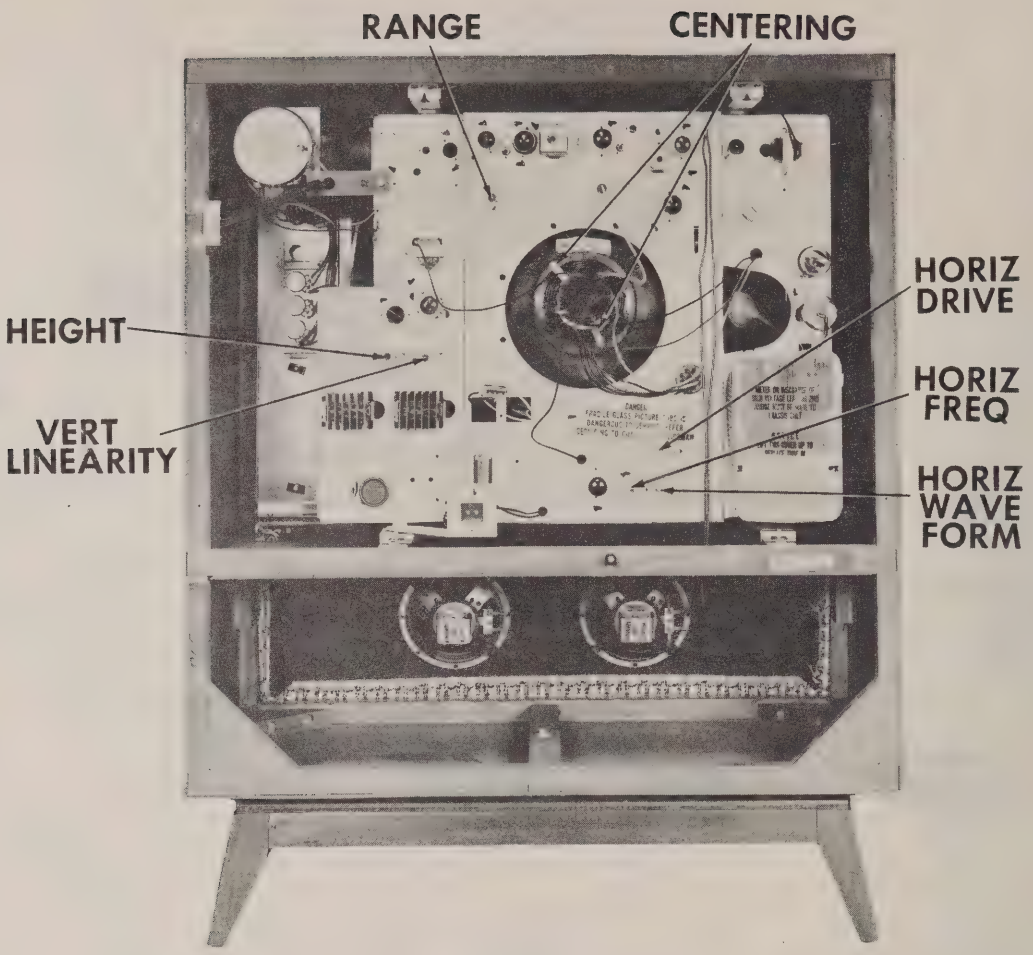
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3DK6	750K	56Ω	9Ω	10Ω	†10K	†10K	0Ω		
V2	3DK6	.1Ω	150Ω	10Ω	11Ω	†2000Ω	†2000Ω	0Ω		
V3	12BY7A	●300Ω	1meg	0Ω	13Ω	13Ω	12Ω	†3600Ω	†1550Ω	0Ω
V4	3BN6	●320Ω	6Ω	9Ω	8.5Ω	†6200Ω	4.8Ω	†330K		
V5	5AQ5	0Ω	330Ω	16Ω	15Ω	†900Ω	†470Ω	0Ω		
V6	6CG7	†1.5meg	2.2meg	0Ω	12Ω	11Ω	†13K	47K	0Ω	0Ω
V7	10DE7	†400Ω	2.2meg	2.2meg	15Ω	13Ω	● ǂ1.6meg	● 900K	200Ω	● 1800Ω
V8	6CG7	†56K	410K	0Ω	8.5Ω	7.5Ω	●†38K	1.5meg	410K	0Ω
V9	12DQ6A	TP	4Ω	NC	†10K	470K	NC	6Ω	100Ω	TOP CAP ǂ10Ω
V10	12AX4GTA	NC	NC	¶1.2meg	NC	†.1Ω	NC	4Ω	2Ω	
V11	1K3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ310Ω
V12	21CBP4A	6Ω	● 20K	Pin 6 †100K	Pin 10 ǂ10meg	Pin 11 ● 250K	Pin 12 7.5Ω			
V201	2BN4	0Ω	5000Ω	0Ω	.5Ω	†2500Ω	0Ω	5000Ω		
V202	5CG8	10K	†7100Ω	0Ω	2Ω	.5Ω	†2500Ω	†11K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 255V SOURCE.
ǂ MEASURED FROM PIN 3 OF V10.

NC NO CONNECTION.
TP TIE POINT

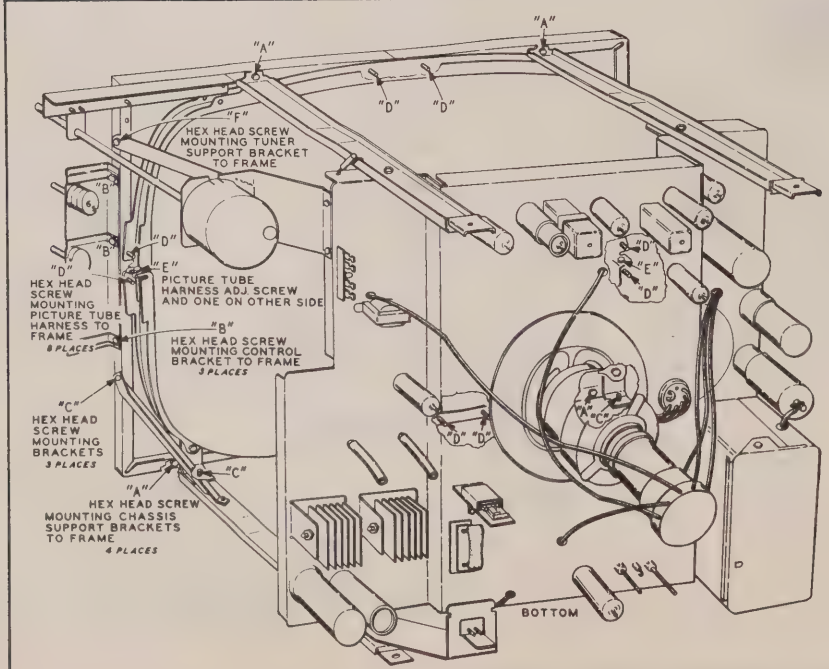


TUBE PLACEMENT CHART



CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS



PICTURE TUBE REMOVAL

1. Remove 4 screws marked "A".
2. Remove 3 screws marked "B" and 1 screw marked "F".
3. Remove 3 screws marked "C" and lift chassis from picture tube frame assembly.
4. Loosen 8 screws marked "D" and 2 screws marked "E".
5. Remove old picture tube and install new tube reversing the steps outlined, keeping the following in mind:

   a. There is a mold match line on the picture tube. Assemble the harness to the picture tube, centering the harness over the mold match line on picture tube. Holes are provided in harness to check the centering. Then tighten the screws marked "E" until the picture tube is firmly in place on harness.
   NOTE: If the above is not observed, difficulty may be encountered in replacing the entire assembly in the cabinet.

PHOTOFACT* Folder with CIRCUITRACE*

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

MODEL UG-4710L (Ch. 9L38)

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT* Folder with CIRCUITRACE*

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

MODEL UG-4710L (Ch. 9L38)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

TRADE NAME	Philco	MODELS	CHASSIS	MODELS	CHASSIS
		G4710L, G4710M	9L38	UG4710L, UG4710M	9L38U
		G4720L, G4720M	9L38A	UG4720L, UG4720M	9L38AU
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.				
TYPE SET	Television Receiver With Portable Picture Tube				
TUBES	VHF Ch. 9L38 - Seventeen		UHF-VHF Ch. 9L38U - Eighteen		
	VHF Ch. 9L38A - Twenty-one		UHF-VHF Ch. 9L38AU - Twenty-two		
POWER SUPPLY	110-120 Volts AC, 60 Cycle		RATING 170 Watts, 1.65 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)				

SERVICING IN THE FIELD LOCATED ON PAGE 3

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL UG-4710L

1. Remove 4 front and 4 side push-on type knobs.
2. Remove picture tube plug from the rear.
3. Remove 9 wood screws holding rear cover. Remove the rear cover.
4. Remove speaker leads.
5. Remove 3 metal screws holding chassis at the rear.
6. Extend antenna outward.
7. Remove chassis.

PICTURE TUBE HOUSING DISASSEMBLY

Yoke and Video Amplifier chassis are accessible by removing 4 metal screws holding rear cover to housing.

1. Remove 2 small metal screws holding bottom metal trim strip.
2. Remove spring holding warp around plastic trim strip at the bottom. Remove plastic trim strip.
3. Remove 2 metal screws now visible holding plastic shell strap at the bottom. Remove strap.
4. Remove front mask.
5. Remove snap-in metal trim caps on side support arms.
6. Remove 2 metal screws now visible holding support arms to rear shell. Remove support arms by turning to line up bottom slots.
7. Remove 2 small metal screws holding rear shell to bottom support bracket.
8. Remove rear shell.

CHASSIS REMOVAL MODEL UG-4720

1. Remove 4 amplifier knobs.
2. Remove two top retaining screws at top rear.
3. Slide cabinet top back (approximately 1") to disconnect AC interlock and to free guides at center top of each side. The entire TV and audio amplifier chassis are now exposed for service.
4. Remove the 2 screws from top edge of chassis.
5. Disconnect TV a.c., phono input and speaker leads. Pilot lamp removes from front clip.
6. Unsolder two leads that connect to remote socket and TV audio leads.
7. The bottom lip of chassis fits into a groove of cabinet bottom. Remove amplifier.
8. Remove TV knobs.
9. Remove 2 front chassis mounting screws from cabinet bottom.
10. Remove the 2 screws from top rear retaining plate.
11. Remove left hand back section (3 screws). Lift back up and out.
12. Remove 2 screws from rear chassis mounting strip (1 screw at right top and 1 screw from left rear).
13. Remove 6AW8A (Video Amp. - Noise Inverter) tube from its socket just to rear of speaker.
14. Lift rear of TV chassis up and out.

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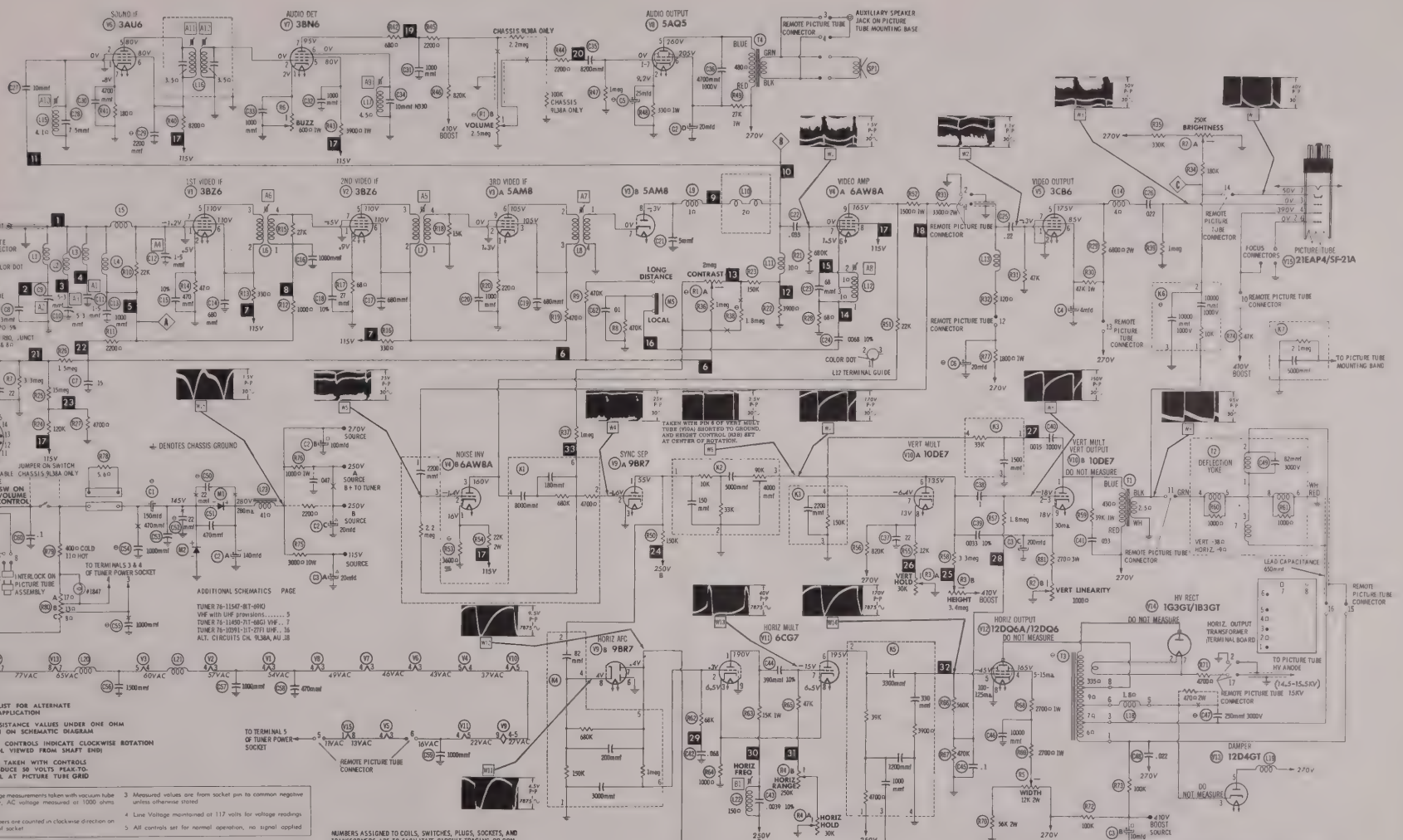
J94

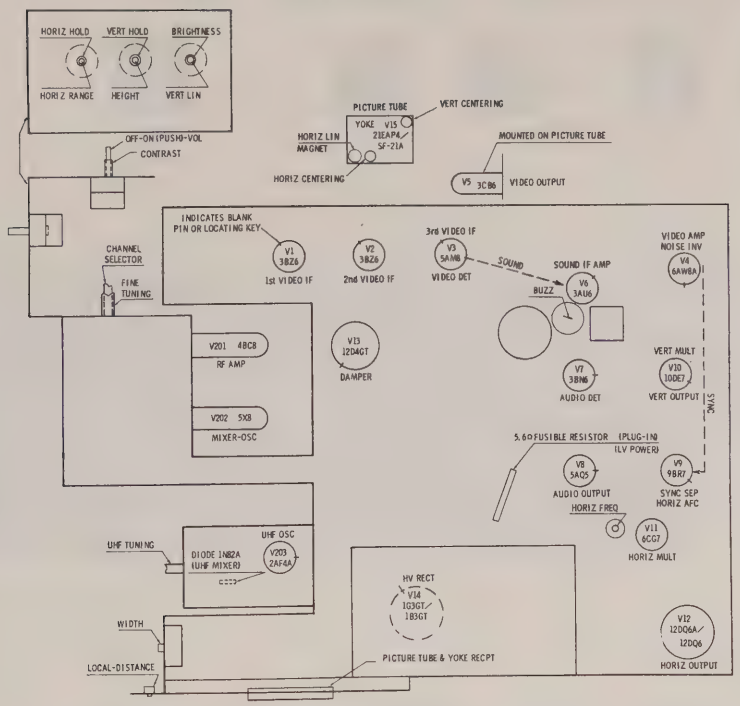
SET 441 FOLDER 2


SOUND IF V6 3AU6
AUDIO DET V7 3BN6
AUDIO OUTPUT V8 5AQ5
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 A 5AM8
V3 B 5AM8
VIDEO AMP V9 A 6AW8A
VIDEO OUTPUT V5 3CB6
NOISE INV V4 B 6AW8A
SYNC SEP V9 B 9BR7
VERT MULT V10 A 10DE7
VERT MULT VERT OUTPUT V10 B 10DE7
HORIZ AFC V9 B 9BR7
HORIZ MULT V11 6CG7
HORIZ OUTPUT V12 12DQ6A/12DQ6
HV RECT Y14 1G3GT/1B3GT
DAMPER V13 12D4GT
PICTURE TUBE V15 21EAP4/SF-21A
CHASSIS 9L38A ONLY
AUXILIARY SPEAKER JACK ON PICTURE TUBE MOUNTING BASE
REMOTE PICTURE TUBE CONNECTOR
VOLUME
BRIGHTNESS
CONTRAST
LONG DISTANCE
LOCAL
COLOR DOT
FOCUS CONNECTORS
DEFLECTION YOKE
VERT LINEARITY
HEIGHT
VERT HOLD
HORIZ FREQ
HORIZ RANGE
HORIZ HOLD
WIDTH
HV ANODE
TO PICTURE TUBE MOUNTING BAND
TO TERMINAL 5 OF TUNER POWER SOCKET
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
JUMPER ON SWITCH CHASSIS 9L38A ONLY
PICTURE TUBE CABLE TERMINAL GUIDE HV LEAD #17
TUNER POWER SOCKET
TUNER 76-11547-8KT-69KO
VHF with UHF provisions 5
TUNER 76-11450-7KT-68KO VHF ... 7
TUNER 76-10391-1KT-27FH UHF ... 16
ALT. CIRCUITS CH. 9L38A, AU, 38
ADDITIONAL SCHEMATICS PAGE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE GRID
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1959
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
TAKEN WITH PIN 6 OF VERT MULT TUBE (V10A) SHORTED TO GROUND, AND HEIGHT CONTROL (R53) SET AT CENTER OF ROTATION.
DO NOT MEASURE
PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

FOLDER 2

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

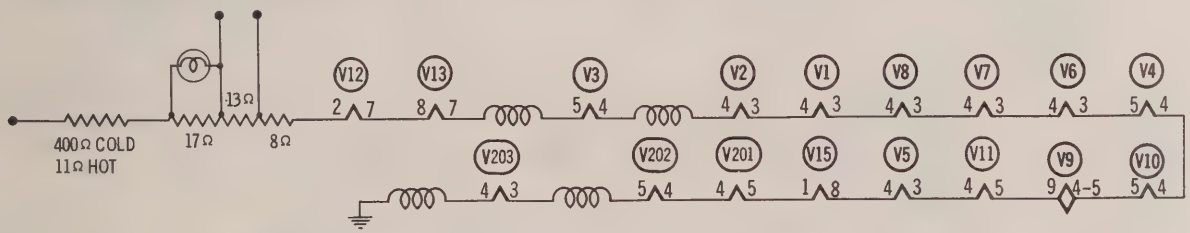
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (5.6Ω), Rectifiers (B+)

SWEEP FAILURE
No raster, has sound - V9, V11, V12, V13, V14, V15, Rectifiers (B+)
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, Rectifiers (B+)
Vert. off freq. - V10
Horiz. off freq. - V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V1, V2, V3
No pic, no sound, has snow - V201, V202, V1, (UHF V203), Diode (UHF Mixer)
No pic, has sound, has raster - V4, V5, V15
Has pic, no sound - V6, V7, V8
Overloaded picture

SYNC FAILURE
No vert. sync - V9
No horiz. sync - V9
No vert. or horiz. sync - V9

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs.

SAFETY GLASS CLEANING

NOTE: Use only mild soap and water to clean.

AGC

The AGC may be varied by a Local-Distance switch. (For location, see tube placement chart.)

FOCUS

The focus may be varied in steps by the position of a plug in the Focus Adjustment terminals.

WIDTH

The width may be varied by Width control. (For location, see tube placement chart.)

HIDDEN ADJUSTMENTS

The Vertical Linearity, Height and Horizontal Range are the inner shafts beneath the Brightness, Vertical & Horizontal knobs.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Set Horizontal Hold to the center of its range. Remove knob and adjust Horizontal Range inner shaft until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSE DEVICE

A 5.6Ω fusible resistor (R78) is used for low voltage power supply protection. (For location, see tube placement chart.)

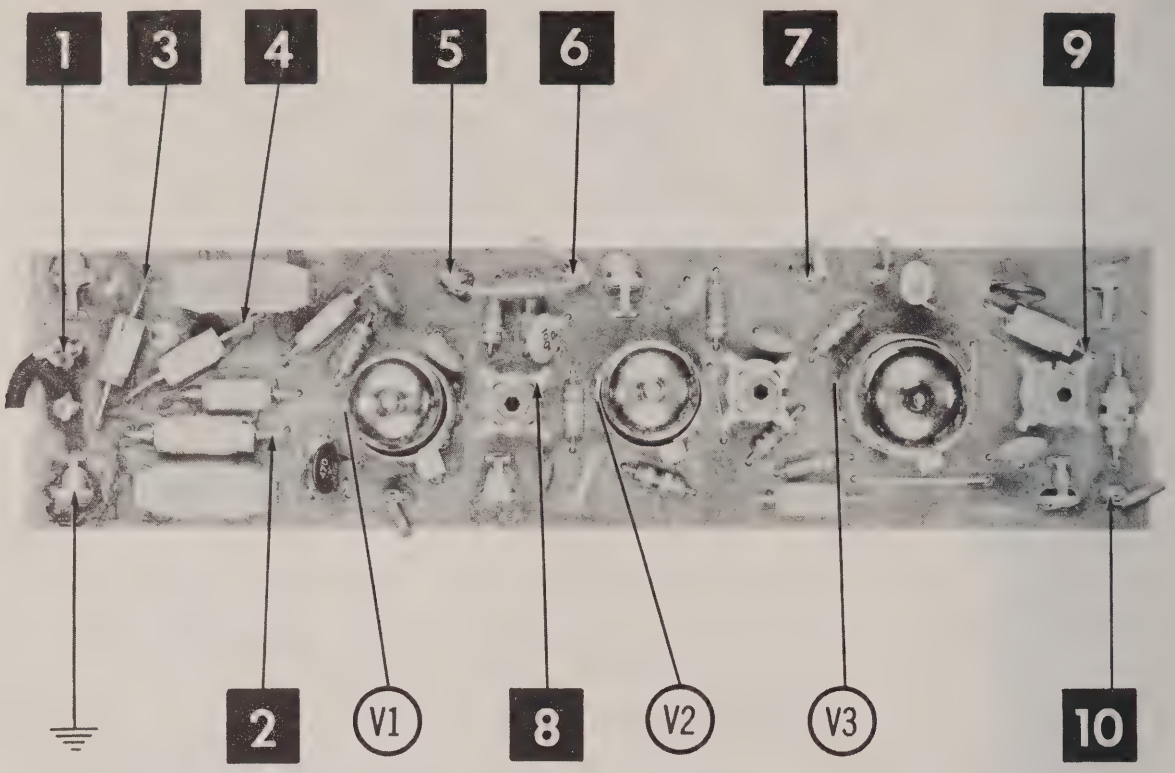
CENTERING

Centering is accomplished mechanically by adjusting Vertical and Horizontal Centering magnets located on yoke housing.

PINCUSHION CORRECTION

One magnet is provided to correct for Horizontal Linearity.

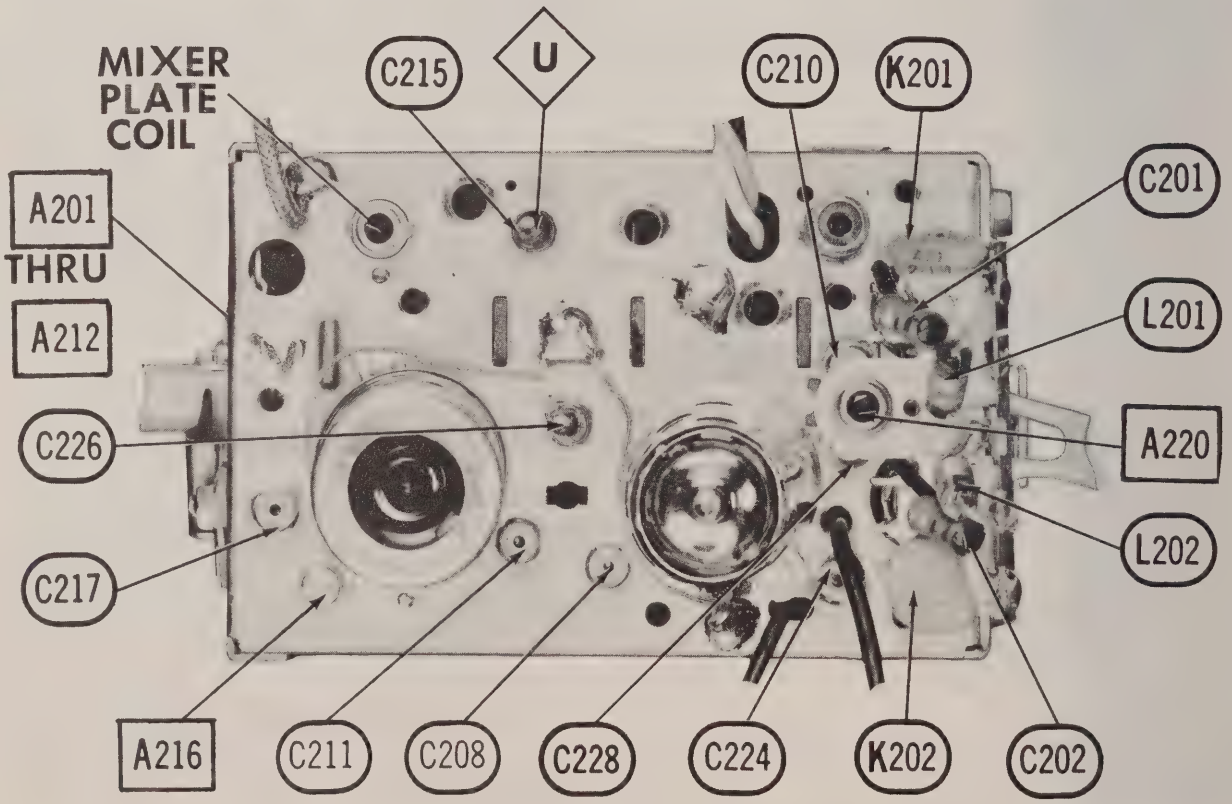
CircuiTrace Numbers 1 thru 10



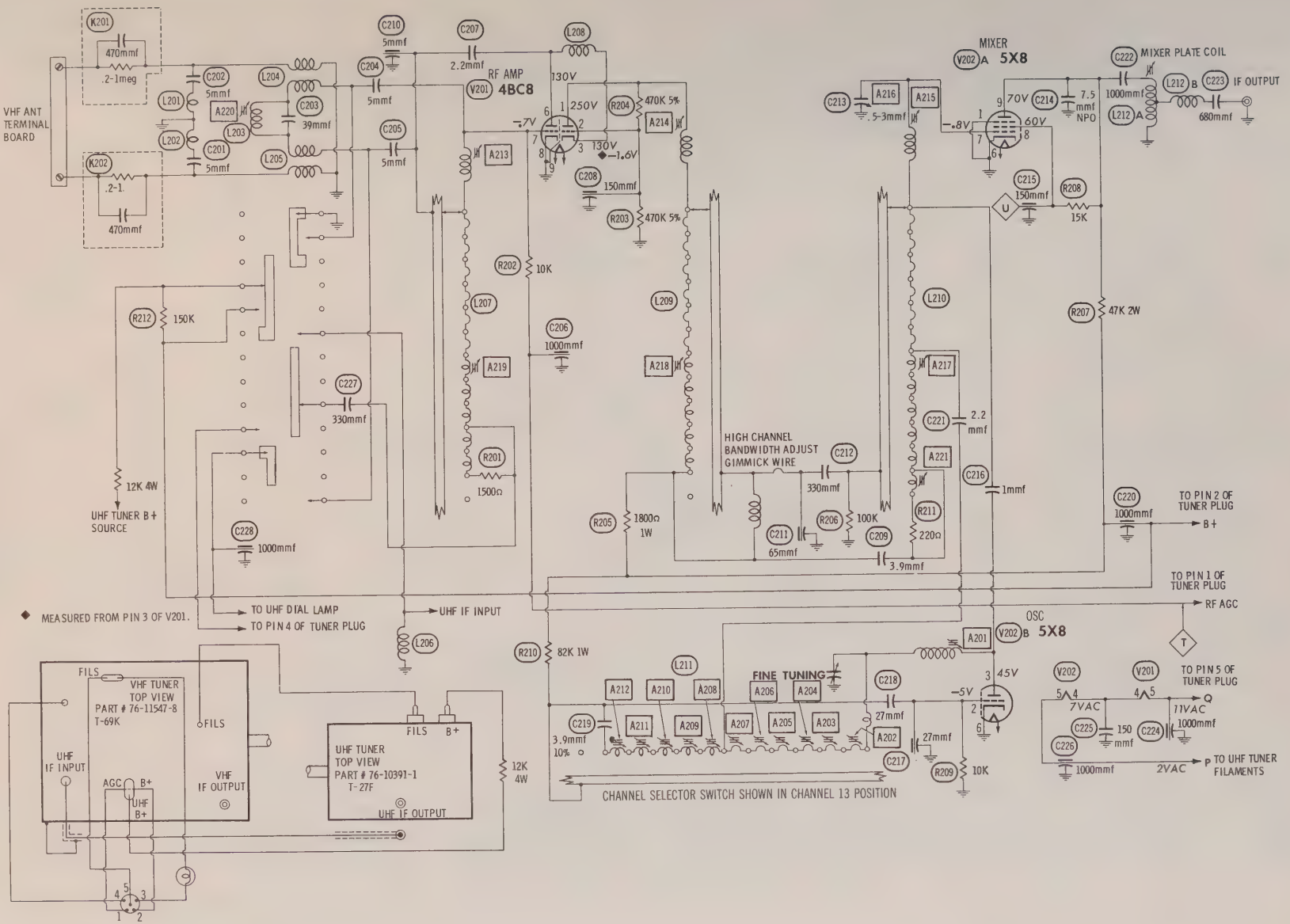
A Howard W. Sams CIRCUITRACE* Photo

VIDEO IF
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



TUNER 76-11547-8 TOP VIEW



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VHF TUNER with UHF provisions 76-11547-8 (T-69K)

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

TUNER PARTS LIST AND DESCRIPTIONS

76-11547-8, 76-10391-1

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	4BC8	
V202	Mixer-Osc.	5X8	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	2AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	5		30-1224-78	SI 5		LT6V5	ZT-555	5GA-V5	
C202	5		30-1224-78	SI 5		LT6V5	ZT-555	5GA-V5	
C203	39		62-03940911	DI-000039	DD-390	L10Q39	UC-5439	5GA-Q39	
C204	5		30-1224-78	SI 5		LT6V5	ZT-555	5GA-V5	
C205	5		30-1224-78	SI 5		LT6V5	ZT-555	5GA-V5	
C206	1000		30-1268-7	EF-001	MFT-1000			503C-D1	
C207	2.2		30-1221-6	NPO-SI 2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	
C208	150		30-1268-6						
C209	3.9		30-1221-14						
C210	5		30-1268-5						
C211	65		30-1268-2						
C212	330		30-1265-2	BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C213	.5-3		31-6520-25		829-3		CT565A		
C214	7.5		30-1251-19						NPO
C215	150		30-1268-6						
C216	1.0		30-1224-82						
C217	27		30-1268-4						
C218	27		30-1224-146	SI 27	D6-270	LT6Q27	UC-5427	5GA-Q27	
C219	3.9		30-1221-14						10%
C220	1000		30-1268-7	EF-001	MFT-1000			503C-D1	
C221	2.2		30-1224-143	NPO-SI 2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	
C222	1000		30-1238-13	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C223	680		30-1238-22	BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	
C224	1000		30-1268-7	EF-001	MFT-1000			503C-D1	
C225	150		30-1265-3	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C226	1000		30-1268-7	EF-001	MFT-1000			503C-D1	
C227	330		30-1265-2	BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C228	1000		30-1268-7	EF-001	MFT-1000			503C-D1	
C229	.68		30-1221-11		TCZ-R68				
C230	30		76-10170						
C231	15		30-1224-133						N1500 ±.25mmf
C232	.5-3		31-6520-1		829-3		CT565A		
C233	250		30-1261						
C234	1000		30-1258	EF-001	MFT-1000			503C-D1	
C235	1000		30-1258	EF-001	MFT-1000			503C-D1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R201	1500Ω		66-2158340	
R202	10K		66-3108340	
R203	470K 5%		66-4478240	
R204	470K 5%		66-4478240	
R205	1800Ω	1	66-2184340	
R206	100K		66-4108340	
R207	47K	2	66-3475340	
R208	15K		66-3158340	

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R209	10K		66-3108340	
R210	82K	1	66-3824340	
R211	220Ω		66-1228340	
R212	150K		66-4158340	
R213	470K		66-4478340	
R214	5600Ω		66-2568340	
R215	1500Ω		66-2158340	

COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES
L201	RF Choke	32-4645-37	
L202	RF Choke	32-4645-37	
L203	IF Trap	32-4719-2	
L204	VHF Ant. Trans.	32-4725	
L205	VHF Ant. Trans.	32-4725	
L206	RF Choke	32-4726-10	
L207	Ant. Coils	76-10112	Channel 2-13, Includes wafer assy.
L208	Cathode Choke	32-4652-51	
L209	RF Coils	328-0116	Channel 2-13, Includes wafer assy.
L210	Mixer Grid Coils	76-10110	Channel 2-13, Includes wafer assy.

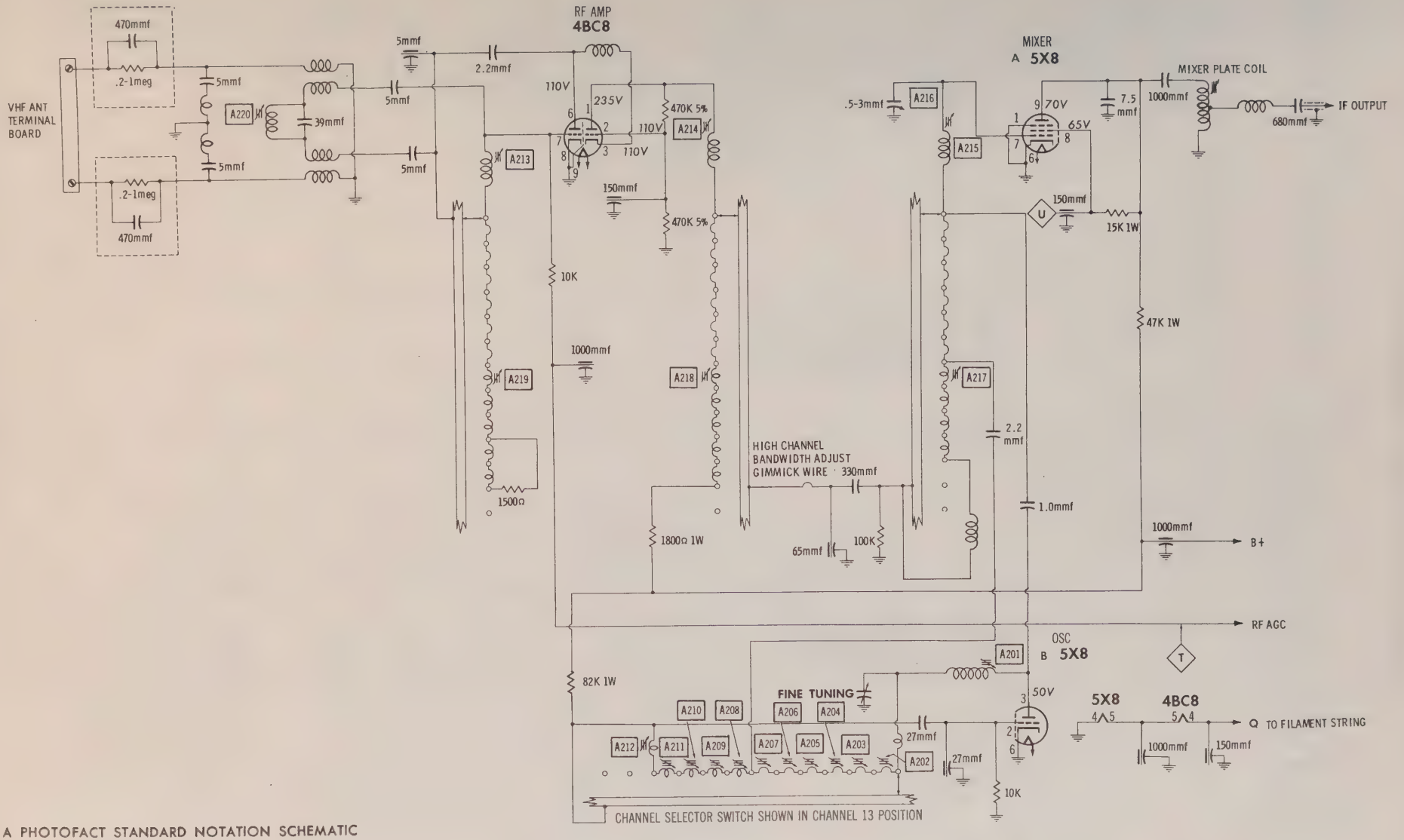
ITEM No.	USE	PHILCO PART No.	NOTES
L211	Osc. Coils	328-0113	Channel 2-13, Includes wafer assy.
L212A	Mixer Plate Coil	32-4629-9	
B	RF Choke		
L213	UHF Ant. Input Assy.	76-10072	Includes C229, R213
L214	Cathode Choke	32-4642-4	
L215	Fil. Choke	32-4642-3	
L216	Fil. Choke	32-4652-44	
L217	RF Choke	76-10170	Includes crystal panel assy.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA	
K201	Antenna Isolation Network	470mmf, .2-1meg	30-6028-1	Centralab Sprague	RC-471 AC1-1
K202	Antenna Isolation Network	470mmf, .2-1meg	30-6028-1	Centralab Sprague	RC-471 AC1-1

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		PHILCO PART No.	CBS PART No.	SYLVANIA PART No.	
M201	1N82A	34-8027	1N82A	1N82A	UHF Mixer (Clip-in)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 76-11450-7 (T-68G)

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggest alignment tools:

A201 thru A212	General Cement #5097 or 8727 Walsco
A213 thru A215	General Cement #9291 Walsco #2520, 2522
A216	General Cement #5000, 5003, 5004, 5008, 5009, 8276 or 9291 Walsco #2515, 2520, 2522, 2525 or 2537
A217, A218, A221	General Cement #5000, 5003, 8276, 8290 or 8609 Walsco #2525
A219	General Cement #8606, 8606L or 9091 Walsco #2542, 2543 or 2544
A220	General Cement #8282, 8606, 8606L or 9295 Walsco #2543, 2544, 2545

VHF OSCILLATOR ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough signal generator output to provide a usable indication on scope.
This procedure uses the traps of the Video IF strip. They must be in proper alignment before attempting to align the oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	209.75MC (400∿ 50% AM Mod)	13	Across Video Detector load.	A201	Adjust for MINIMUM 400∿ indication.
			203.75MC	12		A202	
			197.75MC	11		A203	
			191.75MC	10		A204	
			185.75MC	9		A205	
			179.75MC	8		A206	
			173.75MC	7		A207	
			81.75MC	6		A208	
			75.75MC	5		A209	
			65.75MC	4		A210	
			59.75MC	3		A211	
			53.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓣ. Positive to chassis.
Detune Mixer Plate Coil by connecting a 10 to 20mmf capacitor across it temporarily.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A213	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
3.	"	"	"	"	"	"	A214, A215	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Adjust A214 to set marker positions, A215 for proper tilt.
4.	"	"	177MC	175.25MC	7	"	A216	Adjust to obtain correct tilt on top of curve as in Fig. 202 to compensate for the tuning effect of channel 13.
5.	"	"	213MC	213MC	13	"		Retouch A214 and A215 SLIGHTLY for symmetrical response centered about marker. Repeat steps 4 and 5 alternately until optimum response is obtained on channels 7 and 13.
6.	"	"	85MC	85MC	6	"	A217, A218, A219	Turn A217 counterclockwise until a single peak appears. (DO NOT unscrew far enough to allow the core to fall out.) Adjust A218 until peak falls at 85MC. (It may be necessary to increase sweep generator output.) Adjust A219 for maximum amplitude and symmetry of single peak.
7.	"	"	85MC	83.25MC 87.75MC	"	"		Retouch A217 and A218 for response similar to Fig. 203.
8.	"	"	Not used	43.5MC (400∿ 30% AM Mod)	4	"	A220	Adjust for MINIMUM scope indication.

CONTINUED PAGE 13

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A1 thru A4 ..... General Cement #5004, 5008, or 5009
Walsco #2520
A5 thru A12, & Mixer Plate Coil .... General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	Not used.	45.75MC (400~ 30% AM Mod)	4	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across video detector load).	Mixer Plate Coil	Use only enough generator output to provide a usable indication Adjust for maximum deflection.
2.	"	"	"	41.25MC (Crystal Accuracy)	"	"	A1	Increase generator output. Adjust for MINIMUM 400~ indication.
3.	"	"	"	47.4MC (Crystal Accuracy)	"	"	A2, A3	Increase generator output. Adjust for MINIMUM 400~ indication. Repeat steps 2 and 3.
4.	"	"	"	45.0MC	"	"	Mixer Plate Coil	Use only enough generator output to provide a usable indication Adjust for maximum 400~ indication on scope.
5.	"	"	"	42.7MC	"	"	A4, A5	"
6.	"	"	"	45.75MC	"	"	A6	"
7.	"	"	"	43.85MC	"	"	A7	"
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	65.75MC	"	"	Fine Tuning	Adjust Fine Tuning for MINIMUM 400~ indication on scope. DO NOT change Fine Tuning during balance of alignment.
9.	"	"	69MC (10MC Swp)	42.7MC 43.85MC 45.0MC 45.75MC	"	"		Check for response similar to Fig. 1. If necessary, retouch Mixer Plate Coil to set carrier level, A7 to adjust curve limit, A5 and A4 to adjust low frequency slope of curve and A6 to adjust high frequency side.

4.5MC TRAP ALIGNMENT

The detector used in alignment of the 4.5MC trap must first be padded by connecting to an accurate source of 4.5MC and a VTVM to the output.
Adjust the slug for maximum deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.005mfd	High side to point (B). Low side to chassis.	4.5MC (400~ 30% AM Mod)	Any non-interfering channel	DC probe thru detector probe (Fig. 2) to cathode of picture tube (point (C)). Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a weak station signal (antenna disconnected) and adjust for best picture. Do not change setting of Fine Tuning during balance of alignment.
Connect the antenna for a strong signal. Adjust A9 for maximum sound. Use peak furthest counterclockwise.
Disconnect antenna. Adjust A10, A11 and A12 for maximum sound.
Connect antenna. Retouch A9 for maximum sound.

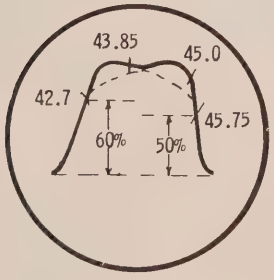


FIG. 1

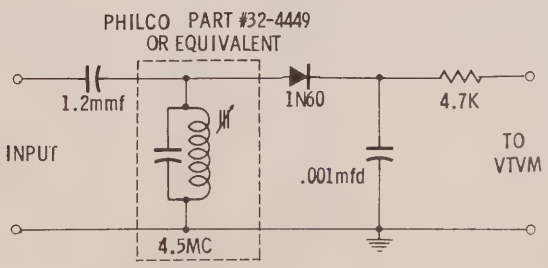


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	3BZ6	
V2	2nd Video IF Amp.	3BZ6	
V3	3rd Video IF Amp. - Video Det.	6AH3	
V4	Video Amp. -Noise Inv.	6AW8A	
V5	Video Output	3CB6	
V6	Sound IF Amp.	3AU6	
V7	Audio Det.	3BN6	
V8	Audio Output	5AQ5	
V9	Sync Sep. -Horiz. AFC	9BR7	
V10	Vert. Mult. -Vert. Output	10DE7	
V11	Horiz. Mult.	6CG7	
V12	Horiz. Output	12DQ6A/ 12DQ6	
V13	Damper	12DW4	
V14	HV Rect.	1G3GT/ 1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	PHILCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No	
V15	21EAP4/ 8F-21A			21EAP4/ 8F-21A ①	①"Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	150	300	30-2568-75 ①	AFHSI-23	XA0261	FPU7	TMS-25	TVL-1429	
C2A	≠140	350	30-2590-40	AFHS4-56-94.9					
B	≠100	300							
C	≠30	300							
D	20	300							
C3A	≠20	300	30-2590-46		C1150				
B	≠10	450							
C	300	25							
C4	4	300	30-2596-3	PRS350V4	BR435	TC90	TD-4-450	TVA-1601	
C5	25	25	30-2417-9 ②	PRS25V25	BRR25-25	TC26	TD-25-25	TVA-1606	
C6	30	300	30-2417-18 ③	PRS450V20	BR2035	TC95	TD-20-350	TVA-1608	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 140mfd @ 200V with same part number.
② Alternate Part #30-2417-60. Combined with C6 in late production (Part #30-2597-3).
③ Alternate Part #30-2417-44. Combined with C5 in late production (Part #30-2597-3).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	CAP.	VOLT	TOL	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	.15	300		30-4650-48	P288N-15		CUB2P15	GEM-3015	2TM-P15	
C8	3.3		NPO 5%	30-1263-38	NPO-DI 3.3	DTZ-3R3	C10Y33C	CNO-533	5TCCB-Y33S 5%*	
C9	5-3			31-6535-1		829-3				
C10	5-3			31-6535-1		829-3				
C11	8-5			31-6535-2		829-8				
C12	8-5			31-6535-2		829-5				
C13	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C14	680			30-1262-15	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C15	470		10%	30-1238-10	DI 470	MD-471		JL-347	5GA-T47S 10% *	
C16	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C17	680			30-1262-15	BPD-00068	DD-681	BYA10T68	B-368	58K-T68	
C18	27		10%	30-1263-6	DI 27	MD-270	L10Q27	CNO-427	5GA-Q27S 10% *	
C19	680			30-1262-15	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	
C20	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C21	5			30-1263	DI 5	MD-050	L10V5	Z7-565	5GA-V5	
C22	.033	300		30-4650-44	P288N-033		CUB6S33	GEM-4133	6TM-S33	
C23	68			30-1263-4	BPD-000068	DD-680	L10Q68	UC-5468	5GA-Q68	
C24	.0068	600	10%	30-4650-57			PM6D68	GTM-6268	6TM-D68	
C25	.22	400		30-4650-49	P488N-22		CUB4P22	GEM-4022	4TM-P22	
C26	.022	400		30-4650-43	P488N-022		CUB4S22	GEM-4122	4TM-S22	
C27	10			30-1221-25	DI 10	MD-100		UC-541	5GA-Q1	
C28	7.5			30-1263-37		DD-7R5	L10V5		5GA-V75	
C29	2200			30-1262-2	BPD-0022	DD-222	BYA10D22	B-222	58K-D22	①
C30	4700			30-1262-3	BPD-0047	DD-472	BYA10D47M	B-347	58K-D47	
C31	1000			30-1262-13	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C32	1000			30-1262-13	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C33	1000			30-1262-13	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C34	10			30-1263-36			TCA-10			
C35	6300			30-1262-1	BPD-0062	DD-622	HVE16D6	B-262	30HKB-D6	
C36	4700	1000		30-1262-3	HVD-15-4700	DD-472	BYA10D47M	B-347	58K-D47	
C37	.22	100		30-4650-6	P288N-33		CUB2P22	GEM-4022	2TM-P22	
C38	.1	400		30-4650-47	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C39	.0033	400	10%	30-4651-14			PM5D33	GTM-4333	5BF-D33	
C40	.0015	1000		30-4650-87	P1086N-0015	DD-152	CUB5D15	GEM-10215	10TM-D15	
C41	.033	400		30-4650-44	P488N-033		CUB6S33	GTM-4133	6TM-S33	
C42	.068	200		30-4650-46	P288N-068		CUB4S68	GEM-4168	4TM-S68	
C43	.0039	200	10%	30-4651-25			PM5D39	GTM-224	2WF-D39	
C44	390		10%	30-1264-1	1469-00039		5R5T39	MCB243	MS-339	
C45	.1	200		30-4650-47	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C46	10000			30-1238-3	BPD-01	DD-103	BYA10S1	B-310	58K-SI	
C47	350	3000		30-1246-23		DD30-351	HVB30T25	3HV-327	30GA-T25	②
C48	.022	400		30-4650-43	P488N-022		CUB4S22	GEM-4122	4TM-S22	
C49	83	3000		30-1246-10	HVD-30-83	DD30-830		3DV-6482		
C50	33				BPD-00022	DD-220	L10Q33	UC-5433	5GA-Q33	③
C51	470			30-1238-10	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C52	33				BPD-000022	DD-220	L10Q22	UC-5422	5GA-Q22	③
C53	470			30-1238-10	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C54	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	④
C55	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	④
C56	1500			30-1263-9	BPD-0015	DD-152	BYA10D15	B-215	58K-D15	
C57	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C58	470			30-1262-16	BPD-00047	DD-471	BYA10T47	B-347	58K-T47	
C59	1000			30-1238-3	BPD-001	DD-102	BYA10D1M	B-210	58K-DI	
C60	.1	600		30-4650-64	P288N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C61	.22	200		30-4678-49	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C62	.01	600		30-4650-58	P688N-01	DD-103	CUB6S1	GEM-611	6TM-S1	

① Some versions may use 2700mmf in this application (Part #30-1262-7).
② Runs 3 thru 4 use 320mmf@ 3000V in this applicaton (Part #30-1246-34).
③ Not used in some versions.
④ Not used in Ch. 9L38, A.
*Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	
R1A	2meg	½	33-5592-34					Contrast, Note 1
B	2.5meg	½						Volume, Note 1
C	Switch							Push-Push Off-On
R2A	250K	½	33-5592-32	F1-34		↑ (QJ-999	↑ (UE-3949	Brightness
B	1000Ω	½		R2-4 *				Vert Lin.
R3A	30K	½	33-5592-28			↑↑ (QJ-1095	↑↑ (UE-3950	Vert. Hold
B	3.4meg	½						Height
R4A	30K	½	33-5592-33	F1-28		↑ (QJ-1094	↑ (UE-3781	Horiz. Hold
B	250K			R2-34 *				Horiz. Range
R5A	12K	2(WW)	33-5574-3	WN-153	A58-15K	W11-Z17	R15ML	Width
B	Shaft			Not Req.	FKS-1/4	SK-8	Not Req. PFL-600	Bass
R6	600Ω	1(WW)	33-5591-6					

Note 1. Run 6 and later use 1meg Contrast, 2.5meg Volume & Switch (Part #33-5592-43).
* Cut and split inner shaft before assembling.
† "Concentrikit" Equivalent: K-6 Kit with Base Elements & Shafts: Bil-130, P1-024 (Panel)
(Not available as a factory assembled unit.) Bil-108, R15-008 (Rear)
†† "Concentrikit" Equivalent: K-6 Kit with Base Elements & Shafts: Bil-121, P1-024 (Panel)
(Not available as a factory assembled unit.) Bil-141, R15-005 (Rear)
† "Concentrikit" Equivalent: K-6 Kit with Base Elements & Shafts: Bil-121, P1-024 (Panel)
(Not available as a factory assembled unit.) Bil-130, R15-005 (Rear)
†† "STA-LOC" Equivalent: FA34L, OS687, RU254L, IS437.
† "STA-LOC" Equivalent: FA35L, OS687, RU13L, IS437.
†† "STA-LOC" Equivalent: FA34L, OS687, RU46L, IS437.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R7	3.3meg		66-5338340	
R8	470K		66-4478340	
R9	470K		66-4478340	
R10	22K		66-3238340	
R11	2300Ω		66-2238340	
R12	1000Ω		66-2108340	
R13	330Ω		66-1338340	
R14	47Ω		66-0478340	
R15	27K		66-3278340	
R16	330Ω		66-1338340	
R17	68Ω		66-0688340	
R18	15K		66-3158340	
R19	470Ω		66-1478340	
R20	220Ω		66-1228340	
R21	680K		66-4688340	
R22	3900Ω		66-2398340	
R23	150K		66-4158340	
R24	120K		66-4128340	
R25	15meg		66-5158340	
R26	1.5meg		66-5158340	
R27	6500Ω		66-2478340	
R28	68Ω		66-0688340	
R29	6800Ω	2	66-2685340	
R30	47K	1	66-3478340	
R31	47K		66-3478340	
R32	120Ω		66-1128340	
R33	3900Ω	2	66-2398340	
R34	180K		66-4188340	
R35	330K		66-3338340	
R36	1meg		66-5108340	
R37	1meg		66-5108340	
R38	1.5meg		66-5158340	Note 1
R39	1meg		66-5108340	
R40	8200Ω		66-2828340	
R41	180Ω		66-1188340	
R42	6800		66-1688340	
R43	3900Ω	1	66-2394340	
R44	2300Ω		66-2228340	
R45	2200Ω		66-2228340	

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R46	820K		66-3828340	
R47	1meg		66-5108340	
R48	330Ω	1	66-1334340	
R49	27K	1	66-3274340	
R50	150K		66-4158340	
R51	22K		66-3228340	
R52	1500Ω	1	66-2154340	
R53	36000 5%		66-2368240	Note 2
R54	22K	2	66-3228340	
R55	12K		66-3128340	
R56	820K		66-4828344	
R57	1.6meg		66-5168340	
R58	3.3meg		66-5338340	
R59	39K		66-3394340	
R60	1000Ω		66-2108340	
R61	1000Ω		66-2108340	
R62	68K		66-3688340	
R63	15K	1	66-3154340	
R64	1000Ω		66-2108340	
R65	47K		66-3478340	
R66	560K		66-4568340	
R67	470K		66-4478340	
R68	2700Ω	1	66-2274340	
R69	2700Ω	1	66-2274340	
R70	56K	2	66-3568340	
R71	4700Ω		66-2478340	
R72	100K	1	66-4108340	
R73	100K	1	66-4108340	
R74	47K		66-3474340	
R75	3000Ω	10	33-1362-12	
R76	1000Ω	1	66-2104340	
R77	1800Ω	1	66-2184340	
R78	5.6Ω		33-1366-3	
R79	400Ω Cola		33-1343-11	
	1Ω Hot			
R80A	17Ω			
B	13Ω		33-1368-10	
C	8Ω			
R81	270Ω	3	33-1363-19	

Note 1. Not used in Run 6 and higher. Note 2. Some versions may use 3300Ω 5% in this application (Part #66-2338240).

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Sync Coupling	180mmf, 2300mmf, 8000mmf, 470Ω, 680K, 2.5meg	30-8519-1	
K2	Vert. Integrator	180mmf, 4000mmf, 5000mmf, 10K, 33K, 90K	30-8030-7	Sprague V-23
K3	Vert. Feedback	1500mmf, 2200mmf, 33K, 150K	30-8509-2A	"
K4	Horiz. AFC	82mmf, 200mmf, 3000mmf, 150K, 680K, 1meg	30-8034-1	Sprague C-6
K5	Horiz. Circuit	330mmf, 1000mmf, 1300mmf, 3300mmf, 3900Ω, 4700Ω, 39K	30-8512-7	
K6	Vert. Retrace	10000mmf @ 1000V, 10000mmf @ 1000V, 10K	30-8037-1 ①	Sprague RS-4
K7	Picture Tube Isolation	5000mmf, 2-1meg	30-8028-2	Sprague ACI-4

① Runs 1 and 2 used individual components in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	47.4MC Trap	32-4645-32	19-1001	BC-562	4604		
L2	47.4MC Trap	32-4645-19	19-1002	BC-563	4606		
L3	41.25MC Trap	32-4645-34					
L4	RF Choke	32-4645-20			4584		.23 Microhenry
L5	1st Video IF	32-4645-36	19-3001	TV-189	6175	VP-9	
L6	2nd Video IF	32-4686-2					
L7	3rd Video IF	32-4686-2					
L8	4th Video IF	32-4686-3					
L9	Resonant Choke	32-4645-7					3 Microhenries

COILS (cont)

ITEM No	USE	REPLACEMENT DATA					NOTES
		PHILCO PART No	Meissner PART No	Merit PART No	Miller PART No	Ram PART No	
L10	Resonant Choke	32-4674-1					22 Microhenries
L11	Shunt Peaking Coil	32-4762-8	19-4201	TV-197	6154		220 Microhenries
L12	4.5MC Trap	32-4644-18					
L13	RF Choke	32-4480-7	19-1008		4609		5 Microhenries
L14	Series Peaking Coil	32-4480-36	19-3180	TV-184	6180	VP-5	180 Microhenries
L15	1st Sound IF	32-4644-12					
L16	2nd Sound IF	32-4745-2					
L17	Quadrature Coil	32-4644-13					
L18	Resonant Choke	33-4113-43 †					.81 Microhenry
L19	Resonant Choke	32-4645-35					2.9 Microhenries
L20	Fil. Choke	32-4645-35					2.9 Microhenries
L21	Fil. Choke	32-4645-35					2.9 Microhenries

† Part of T3 (Part #32-8881-3).

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L22	150Ω		32-4754-3						Horiz. Freq.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 (~)	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L23	300A	41Ω	1-3 Hy.	32-8710-4					26C44	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	32-8829-2	Z1900 ①	A-2823			A-8142 ②	26S72	A-108X
T2	Yoke-Horiz. (5MH) (110°)-Vert. (38MH)	76-10508-8							
	Rear Cover & Centering Device	76-10615-5							
T3	Horiz. Output	32-8881-3 ③							
	Alt. Horiz. Output	32-8881-1 ④							
	Alt. Horiz. Output	32-8877-1 ③							

① Use 8 : 1 turns ratio.
② Drill new mounting hole(s).
③ Used in Run 4 and later.
④ Used in Run 3.
⑤ Used in Runs 1 and 2. Not interchangeable with later units.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	Halldonan PART No.	Merit PART No.	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T4	10K	3-4Ω	32-8876-1	Z1117	A-2932	AU-606	A-3879	24S52	S-17X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	36-1676-4	46A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	PHILCO PART No	FEDERAL PART No	GENERAL ELECTRIC PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No.	
M1	280A	34-8048-1 ①	HF504 ①		SD-500 ①	M500 ①	① Silicon Type.
M2	280A	34-8048-1 ①	HF504 ①		SD-500 ①	M500 ①	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Tuner	76-11547-6	VHF with UHF provisions (T-69K) Ch. 9L36U, AU
	Tuner	76-11450-7	VHF(T-68G) Ch. 9L38, A
M4	Tuner	76-10391-1	UHF (T-27F)
M5	Switch	42-3075-5	Local-Distance, SPDT (Slide Type)
	Focus Magnet	76-10531-1	
	Correction Magnet	54-8349-1	
	Printed Board	54-8529-1	Video IF
	Printed Board	54-6724-1	Main
	Picture Tube Cable	41-4364-11	

CABINETS & CABINET PARTS

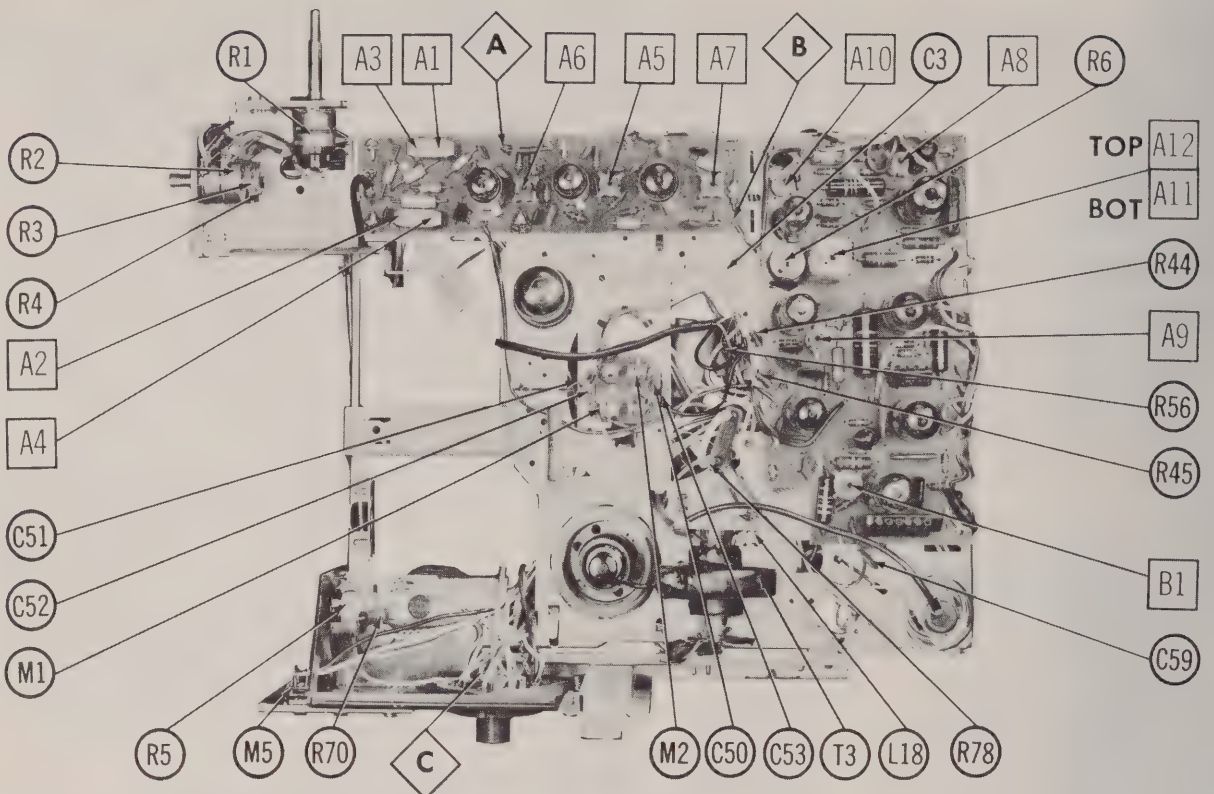
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

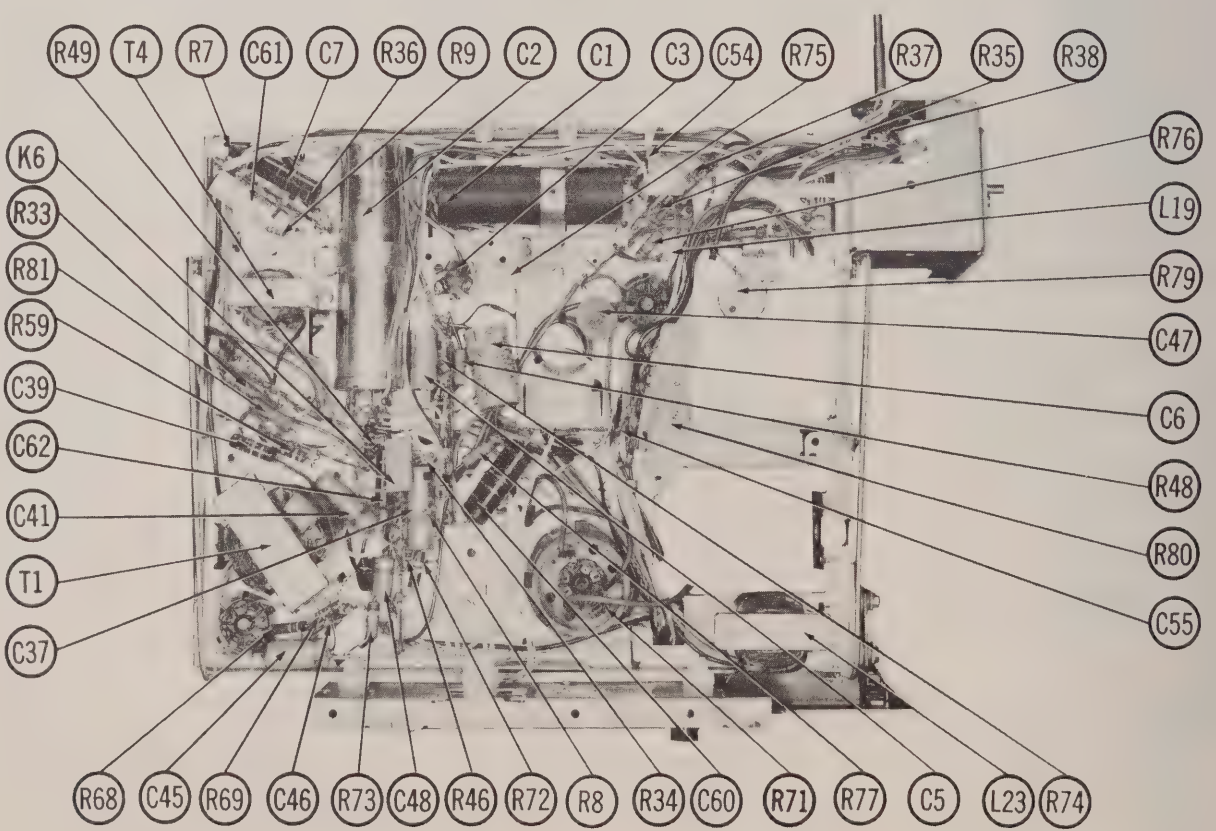
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

PHILCO MODELS G4710L, M, G4720L, M, UG4710L, M, UG4720L, M (Ch. 9L38, A, AU, U)

FOLDER 2



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	1500mmf Ceramic Capacitor	High side to point ⓥ. Low side to chassis.	Not used	43.5MC (400∿ 30% AM Mod)	UHF	Vert. Amp. thru 10K to point ⓤ. Low side to chassis.	A22l	Adjust for flat symmetrical response.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

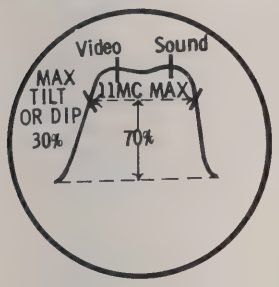


FIG.201

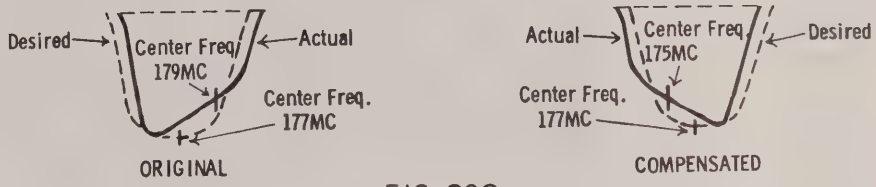


FIG.202

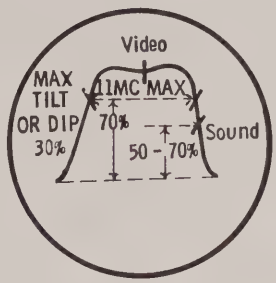
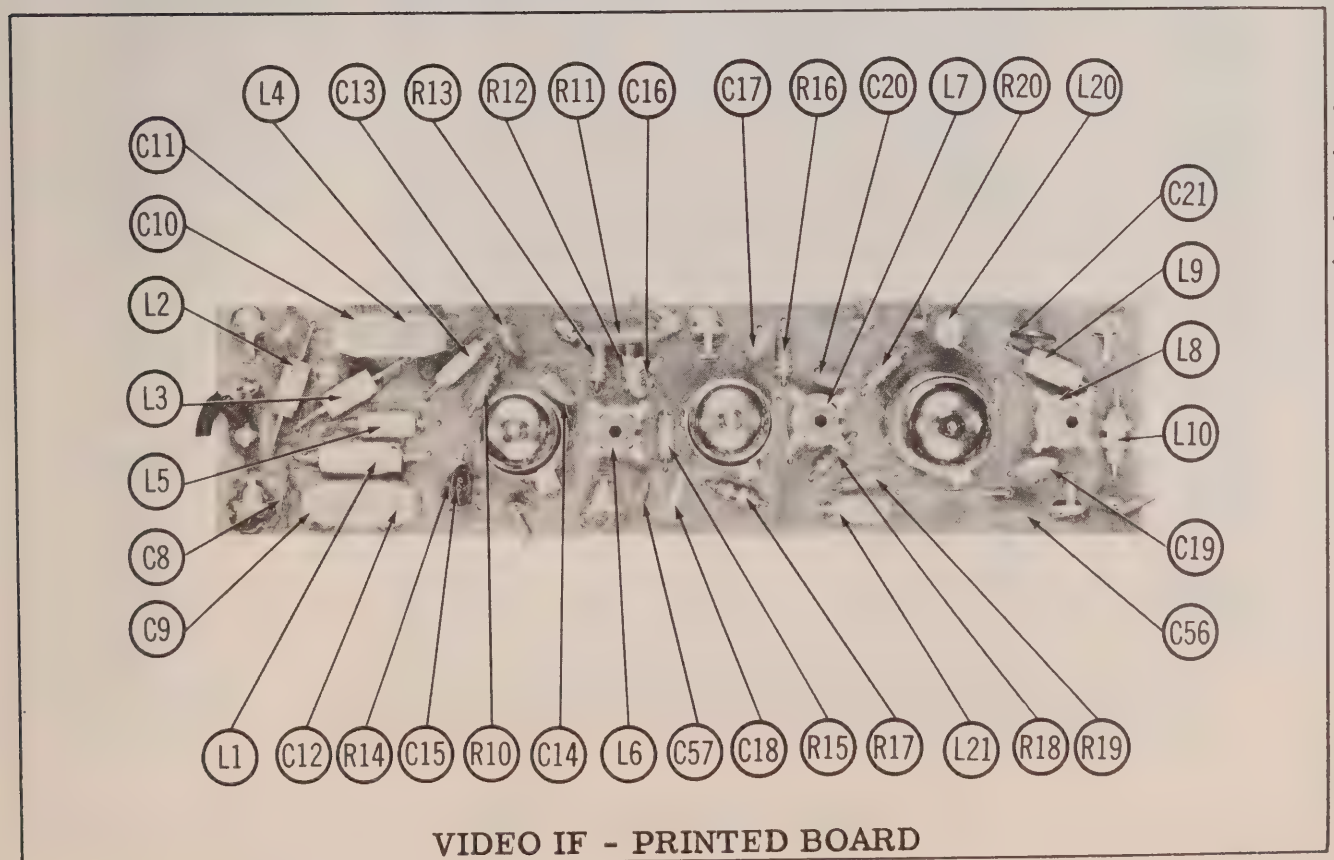
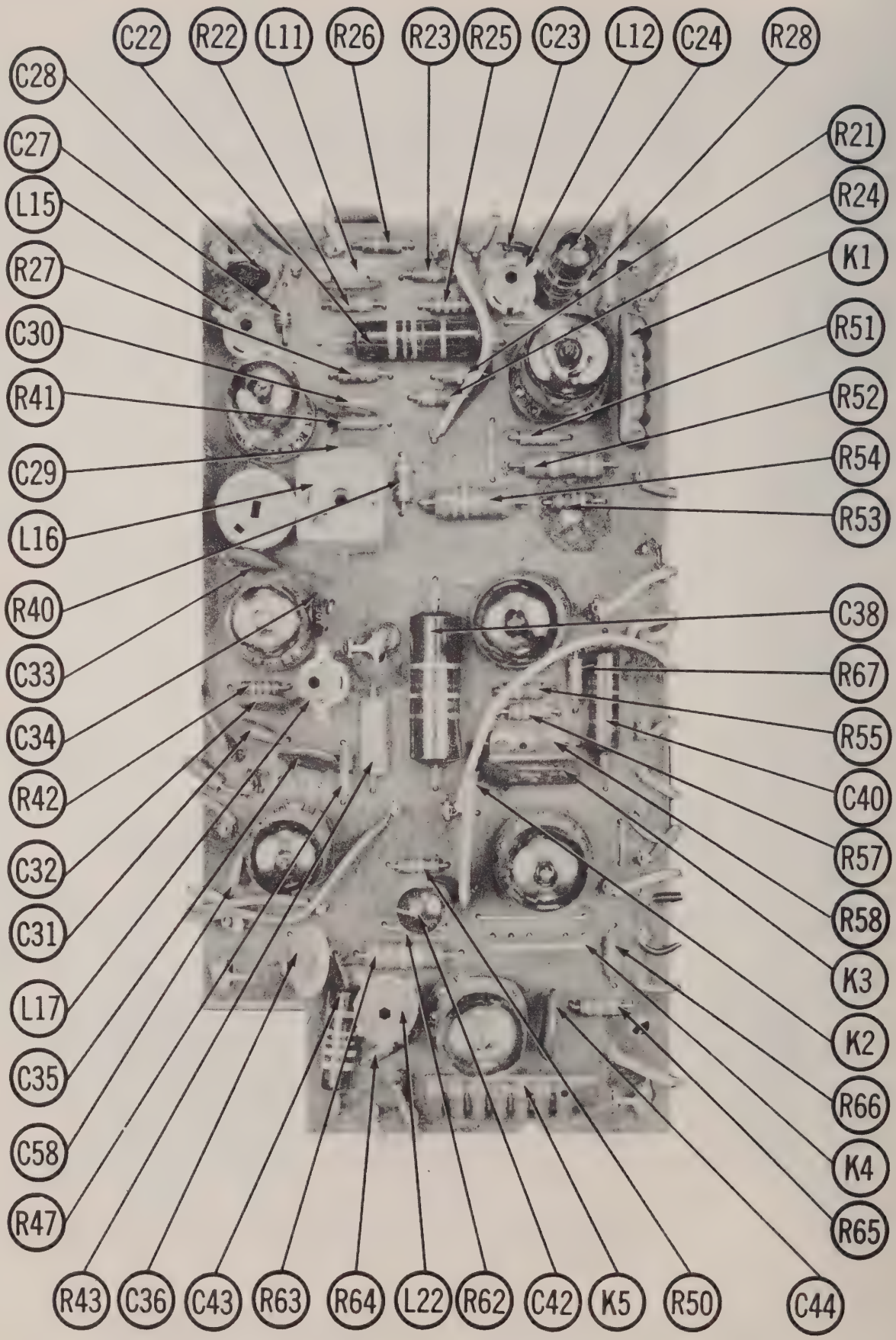


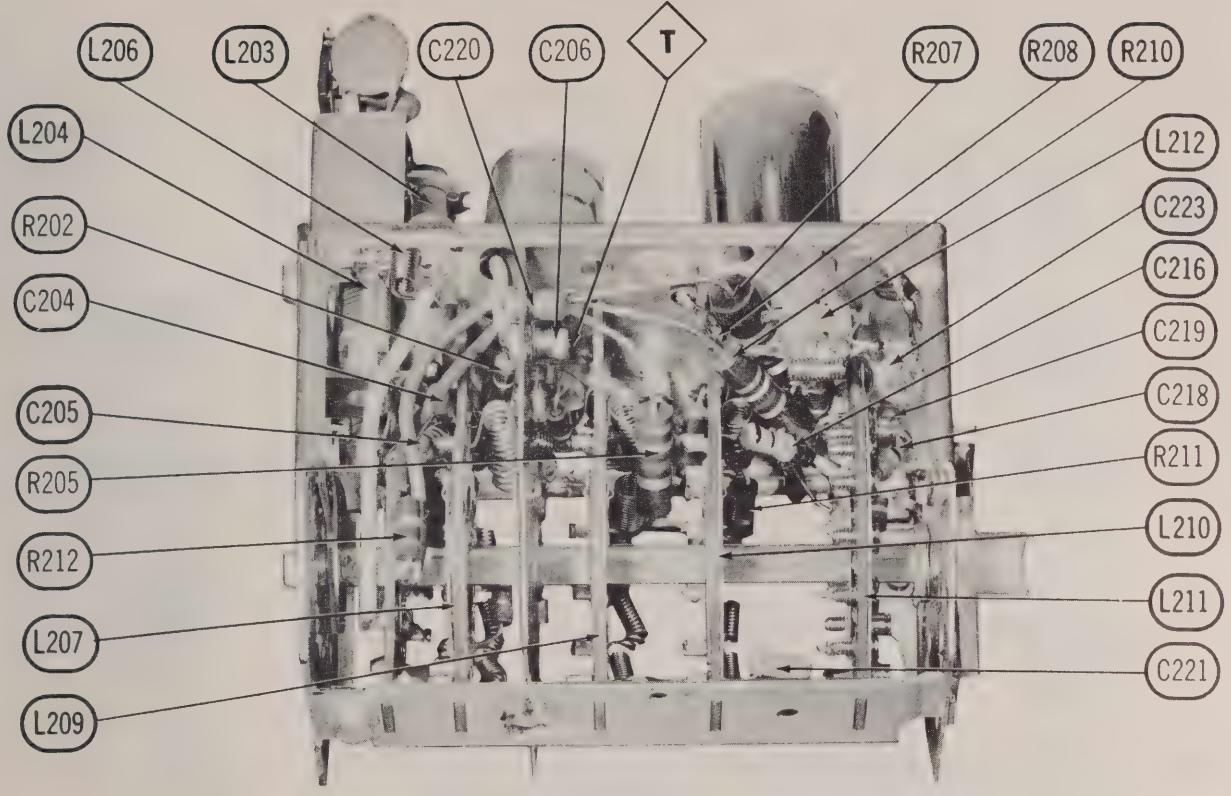
FIG. 203



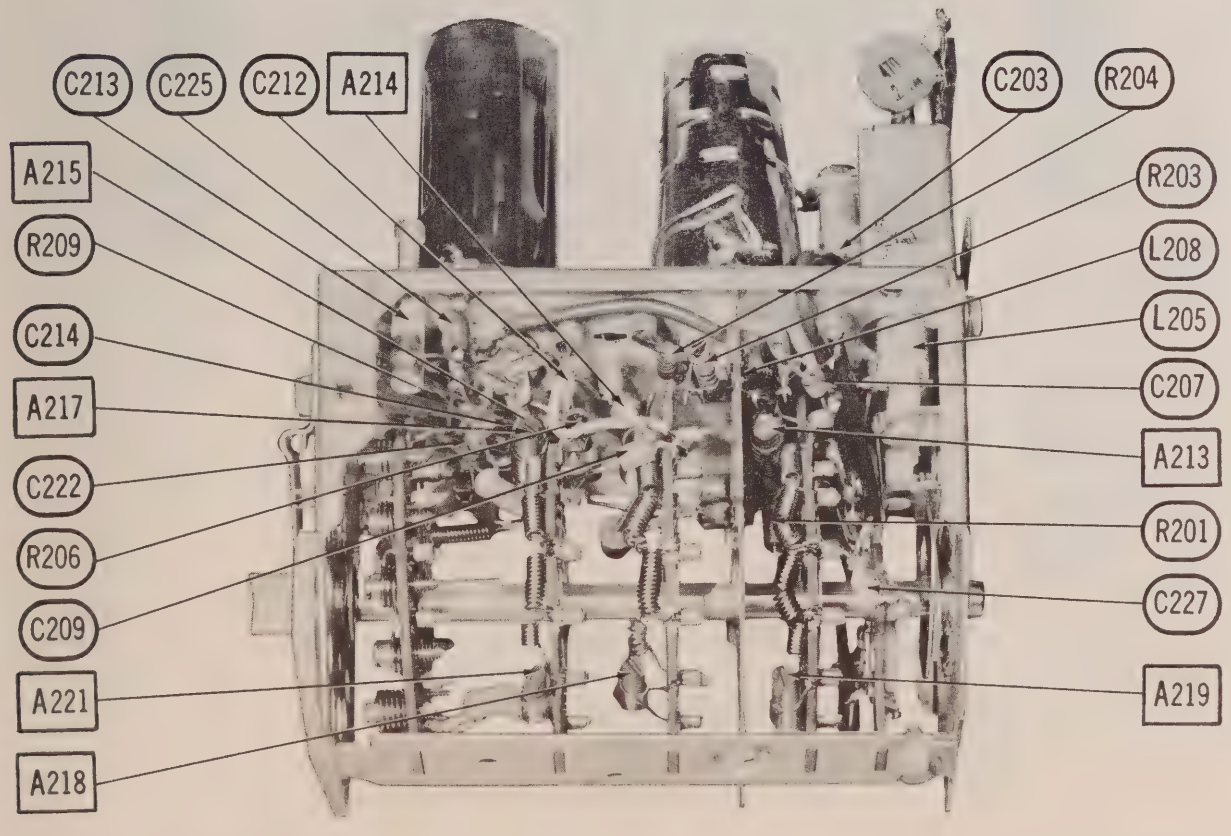
VIDEO IF - PRINTED BOARD



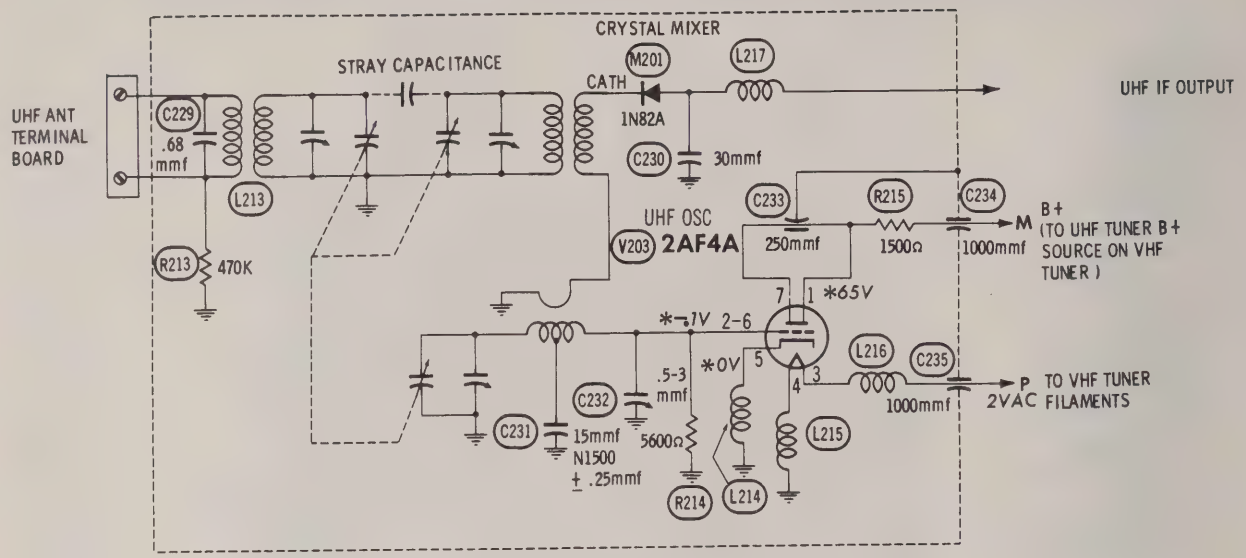
MAIN - PRINTED BOARD



TUNER 76-11547-8 - LEFT SIDE



TUNER 76-11547-8 - RIGHT SIDE



* MEASURED IN UHF POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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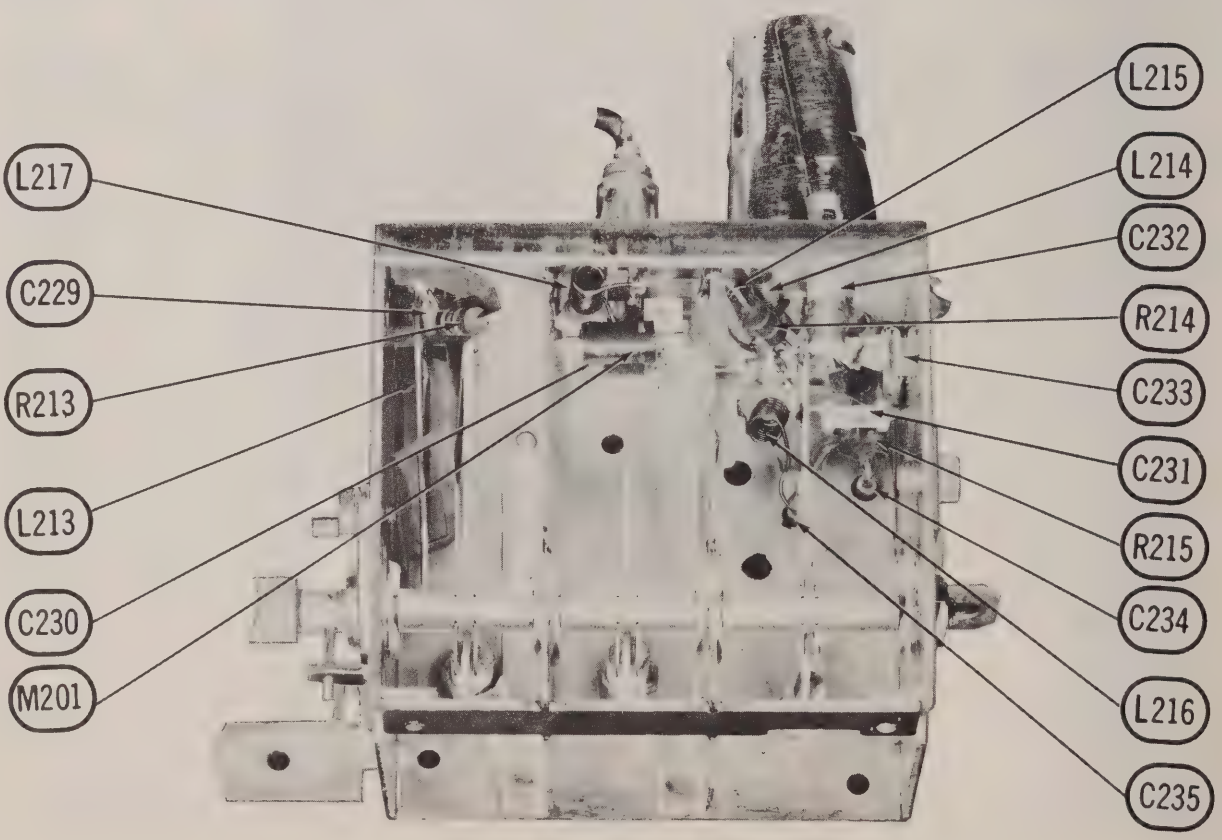
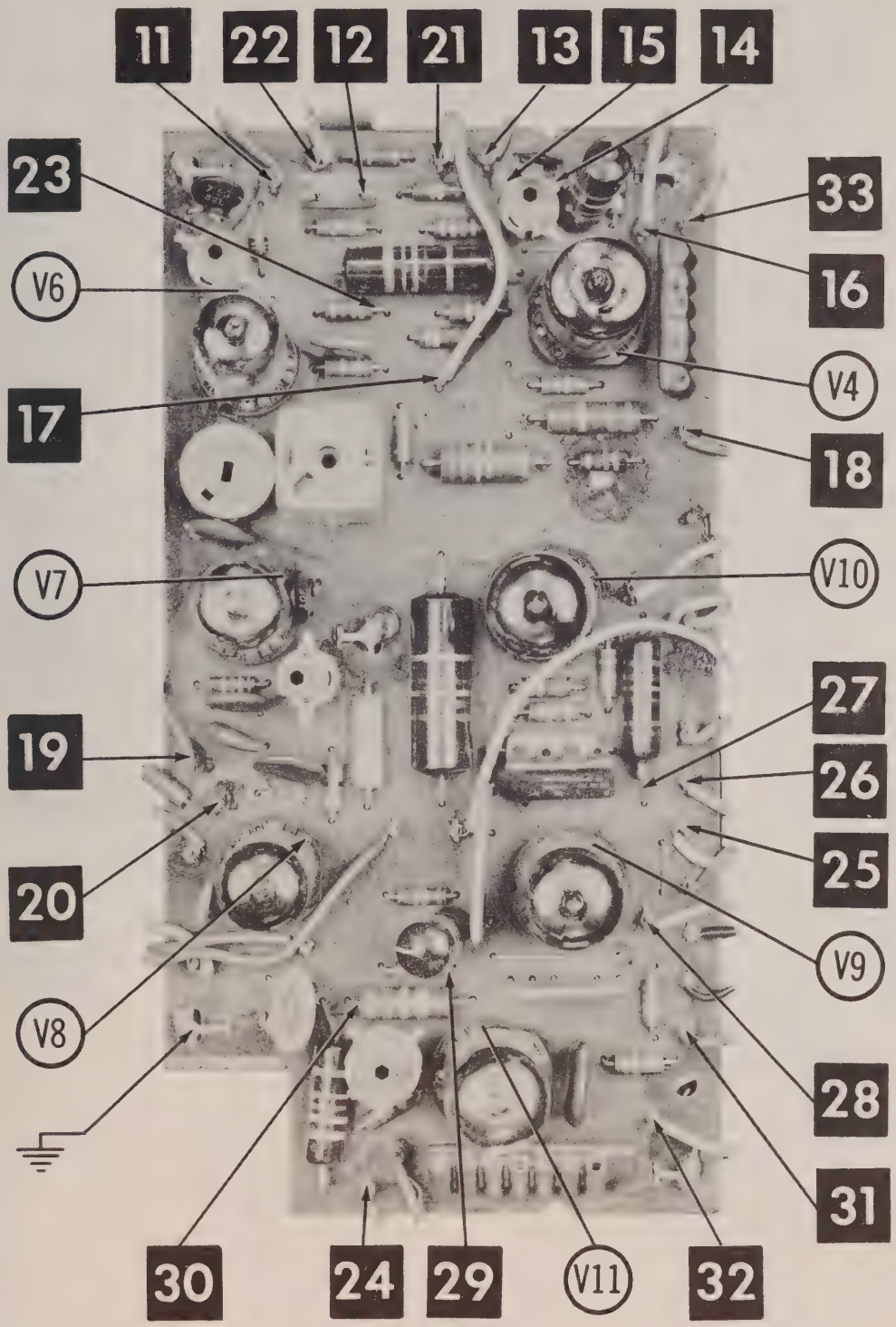
UHF TUNER 76-10391-1 (T-27F)



TUNER 76-10391-1



A Howard W. Sams CIRCUITRACE* Photo

MAIN - PRINTED BOARD

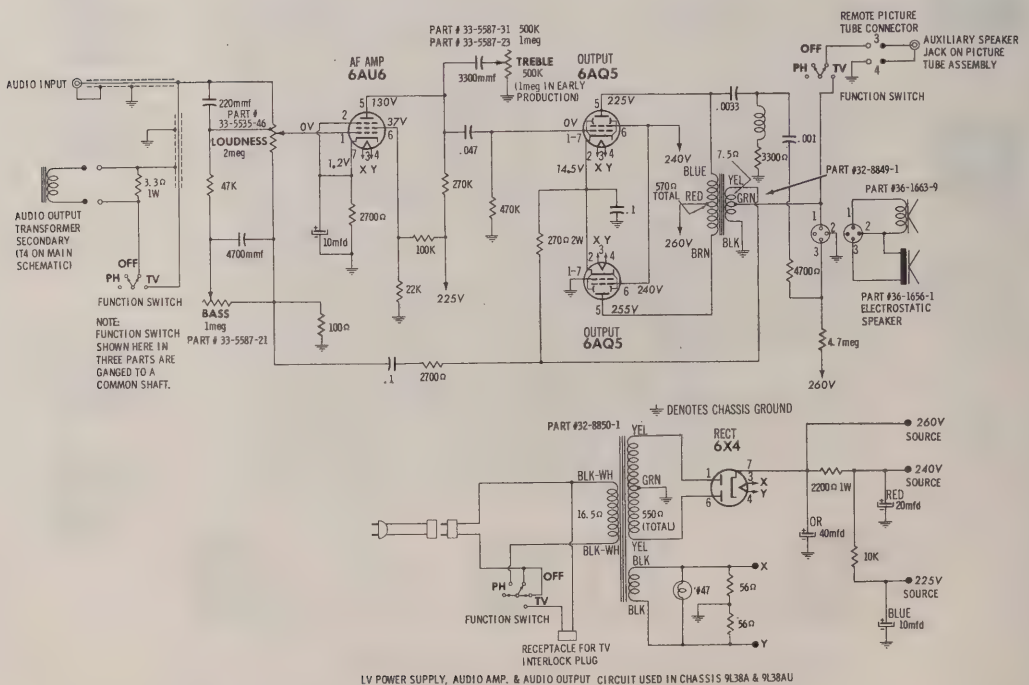
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	1.2meg	47Ω	14Ω	15Ω	†3300Ω	†3300Ω	0Ω		
V2	3BZ6	1.2meg	68Ω	15Ω	16Ω	†3300Ω	†3300Ω	0Ω		
V3	5AM8	220Ω	.1Ω	†3800Ω	16Ω	17Ω	†3800Ω	.1Ω	3900Ω	0Ω
V4	6AW8A	3300Ω	● 4.5meg	†30K	10Ω	11Ω	70Ω	680K	†3000Ω	†6700Ω
V5	3CB6	47K	0Ω	5Ω	4Ω	†6800Ω	†47K	0Ω		
V6	3AU6	4.1Ω	0Ω	11Ω	12Ω	†11K	†11K	180Ω		
V7	3BN6	● 220Ω	3.5Ω	12Ω	13Ω	†6900Ω	4.5Ω	ǂ920K		
V8	5AQ5	1meg	330Ω	13Ω	14Ω	†480Ω	†27K	1meg		
V9	9BR7	†150K	2.2meg	0Ω	8Ω	8Ω	0Ω	830K	150K	6.5Ω
V10	10DE7	†430Ω	2.3meg	2.3meg	10Ω	8Ω	●ǂ4.2meg	150K	●30K	● 500Ω
V11	6CG7	†16K	1.8meg	1000Ω	5Ω	6.5Ω	†45K	●120K	1000Ω	NC
V12	12DQ6A/ 12DQ6	NC	21Ω	NC	● †11K	1meg	TP	19Ω	0Ω	TOP CAP ǂ12Ω
V13	12D4GT	NC	NC	¶250K	NC	†.5Ω	NC	17Ω	19Ω	
V14	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ350Ω
V15	21EAP4/ SF-21A	3Ω	ǂ150K	1meg	ǂ150K	NC	ǂ150K	● 250K	4Ω	
V201	4BC8	†2800Ω	250K	INF	2Ω	3Ω	INF	1.5meg	0Ω	0Ω
V202	5X8	0Ω	10K	†83K	2Ω	.5Ω	0Ω	100K	†48K	†48K
V203	2AF4A	†*14K	5600Ω	.5Ω	0Ω	0Ω	5600Ω	†*14K		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
* MEASURED IN "UHF" POSITION.
† MEASURED FROM 270V SOURCE.
ǂ MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION.
TP TIE POINT



LV POWER SUPPLY, AUDIO AMP. & AUDIO OUTPUT CIRCUIT USED IN CHASSIS 9L38A & 9L38AU

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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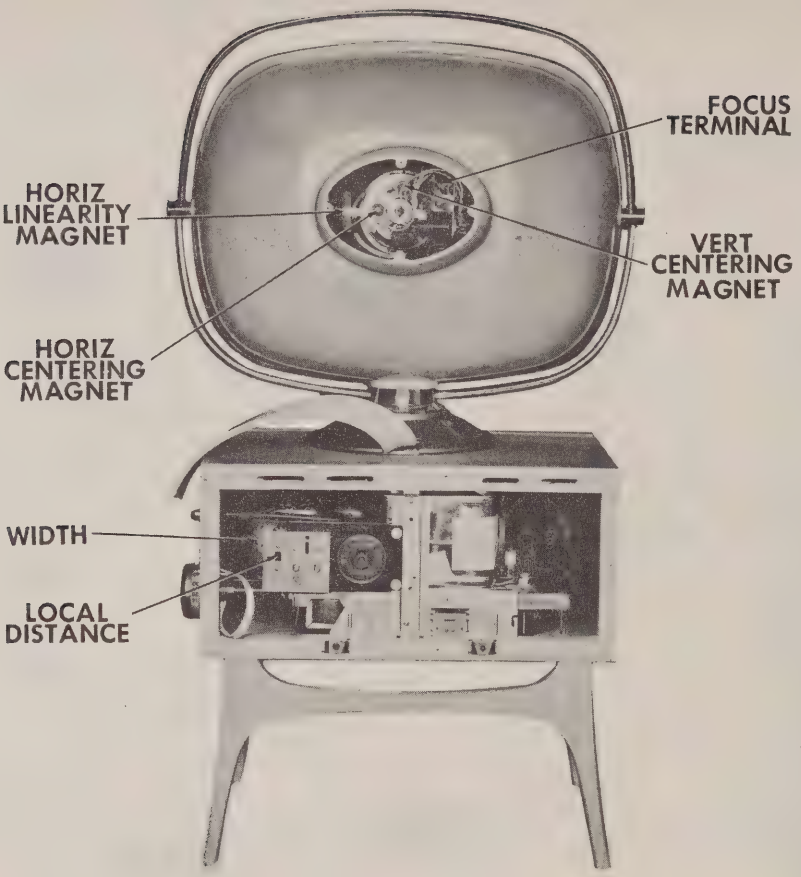
ALTERNATE SCHEMATIC



CABINET—REAR VIEW

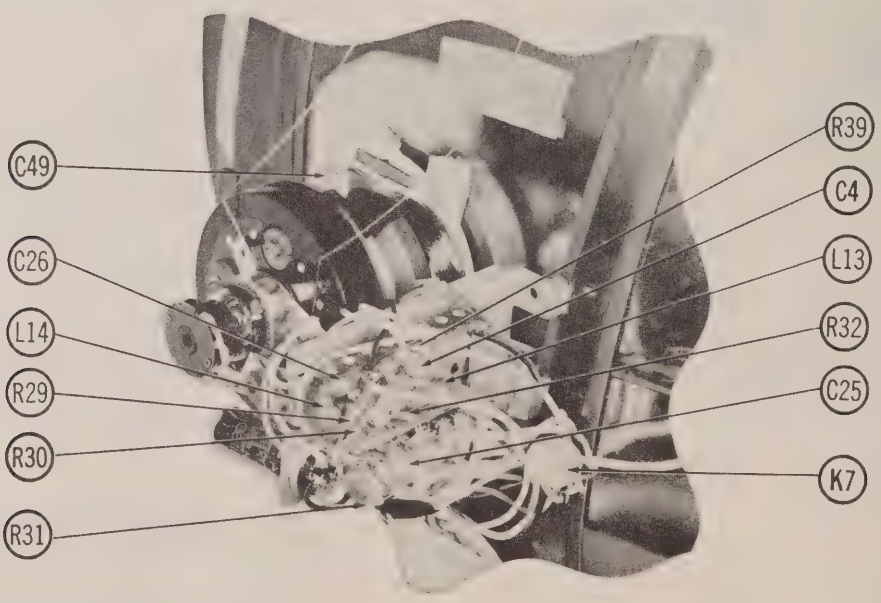
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station signal. Allow the receiver to warm up. Connect a clip lead across the Horizontal Frequency coil (L22).

Set the Horizontal Hold to the center of its range.

Adjust the Horizontal Range (R4B) until the picture appears to float back and forth across the screen.

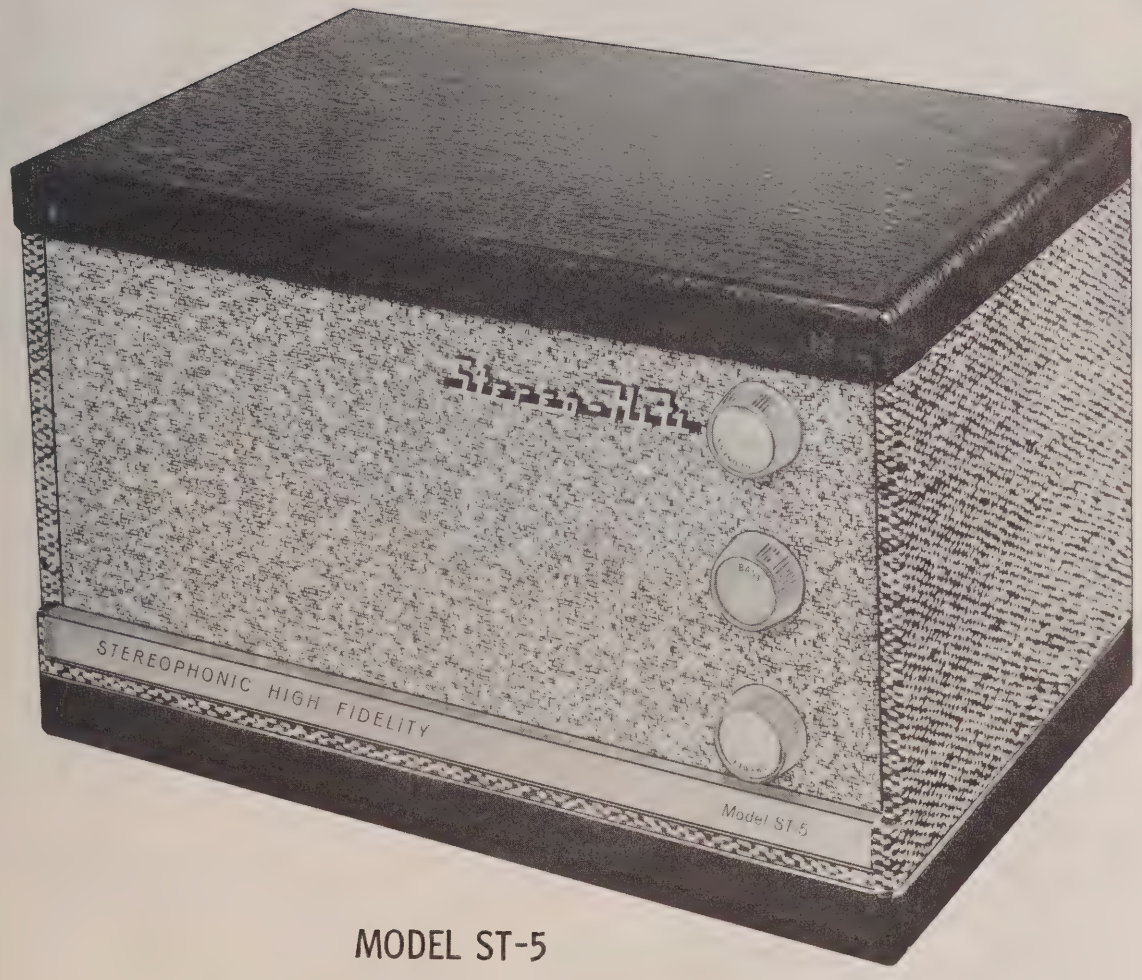
Remove the clip lead from across L22 and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.



SUB CHASSIS

PHOTOFACT* Folder

FANFARE
MODELS ST-5, ST-10



MODEL ST-5

FANFARE
MODELS ST-5, ST-10

TRADE NAME	Fanfare Models ST-5, ST-10
MANUFACTURER	Fanon Electronic Sales Corp., 919 Park Place, Brooklyn 13, N. Y.
TYPE SET	AC-DC Operated 4 Tube Audio Amplifier
POWER SUPPLY	110 - 120 Volts AC-DC RATING 30 Watts, .33 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H986

SET 441 FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	AF Amp. -Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V3	Output	50C5	
V4	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	FANFARE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	80	150		PRS150V80402C	BBRT84215	TCT3117	TDLT-7	TVA-3455	
B	40	150							
C	20	150							
C2	10	150		PRS150V10	BBR10-150	TC42	TD-10-150	TVA-1406	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	FANFARE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	10000				BPD-01	DD-103	BYA10S1	B-110	SHK-S1	
C4	82				SI 82	DD-820	L10Q82	CNO-482	5GA-Q82	
C5	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	270				SI 270	DD-271	L10T27	CNO-327	5GA-T27	
C7	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C8	100				BPD-0001	DD-101	L10T1	CNO310	5GA-T1	
C9	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C13	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	2000				BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C15	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C16	.22	400			P488N-22		CUB4P22	GEM-4022	4TM-P22	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FANFARE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	524-05	B-76	A47-2meg-Z	Q13-139	U55	Loudness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	2meg	½	524-05	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	524-06	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	

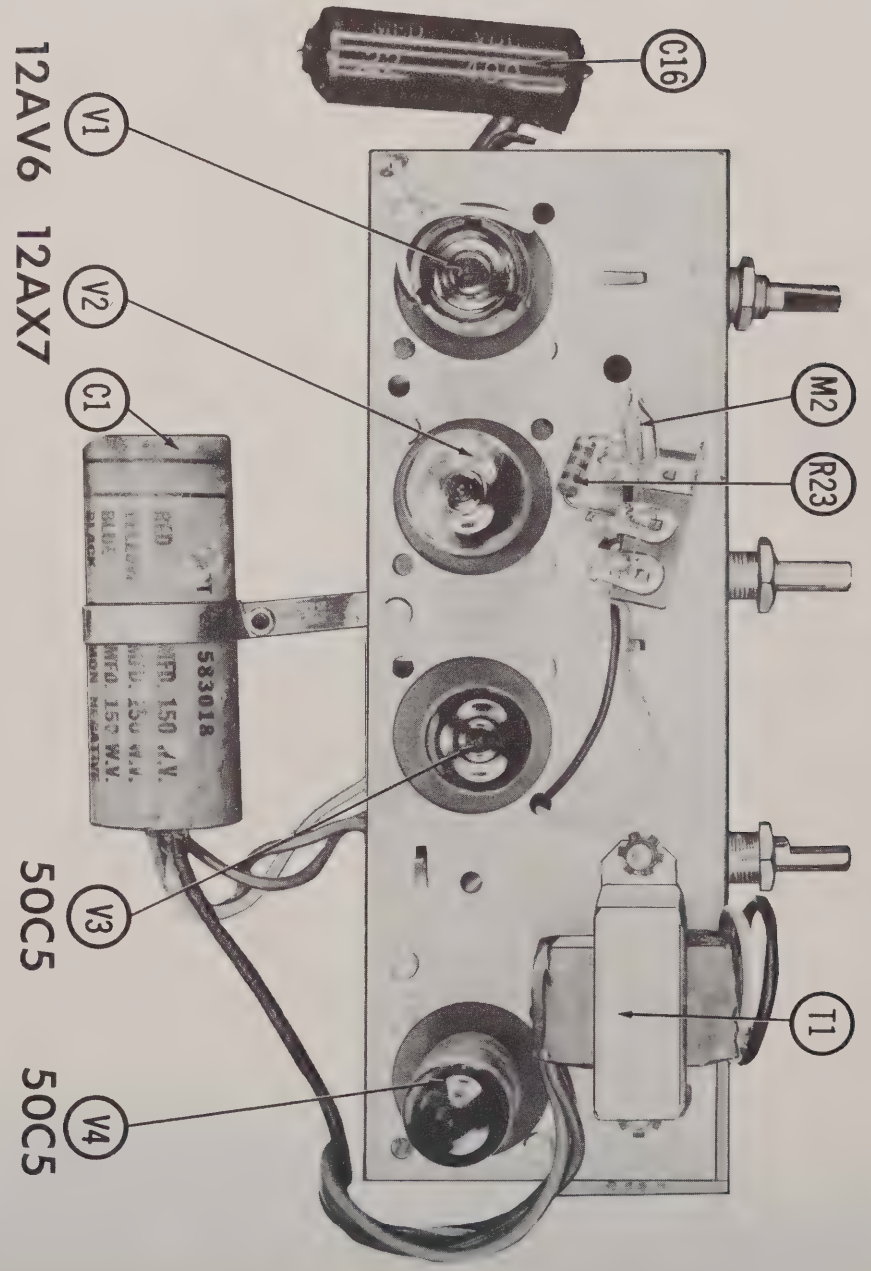
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		FANFARE PART No.	NOTES
	OHMS	WATT		
R4	180K			
R5	1000Ω			
R6	470K			
R7	47K			
R8	470K			
R9	4700Ω			
R10	470K			
R11	100K			
R12	4700Ω			
R13	100K			
R14	470K			

ITEM No.	RATING		FANFARE PART No.	NOTES
	OHMS	WATT		
R15	47K			
R16	150Ω	1		
R17	470K			
R18	47K			
R19	27K			
R20	47K			
R21	47K			
R22	2200Ω			
R23	47K			
R24	150Ω	1		
R25	100Ω			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FANFARE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4300Ω CT	3-4Ω	52A47	Z1001 ①	A-2900 ①		A-3856 ①	24S60 ①	S-51X①	① Use original channel frame

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FANFARE PART No.	QUAM PART No.	
SP1 SP2	8" 3"x3"	PM Electrostatic	3-4Ω	LSH75	8A21	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	FANFARE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.074A		1235AH	T150 SD-94①	150 K200①	① Silicon

MISCELLANEOUS

ITEM No.	PART NAME	FANFARE PART No.	NOTES
M2	Lamp		NE-2

CABINETS & CABINET PARTS

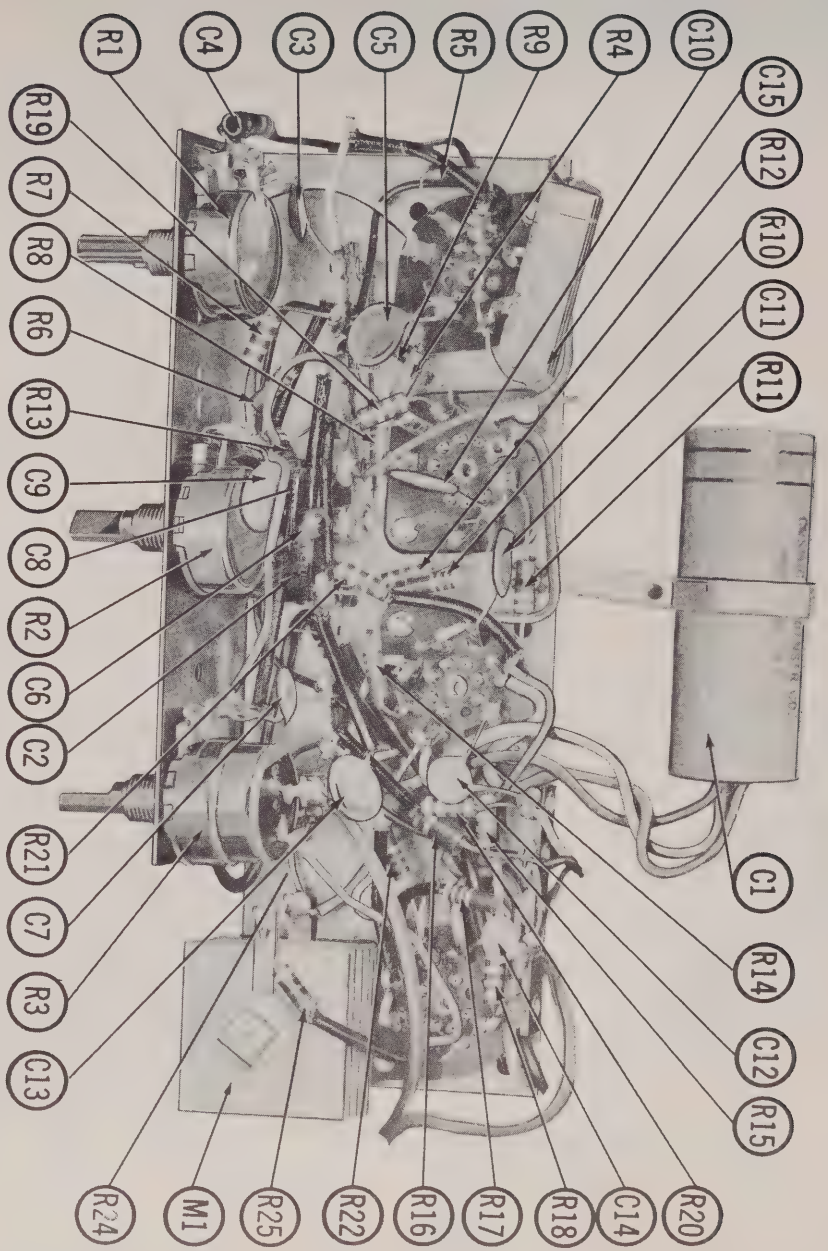
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

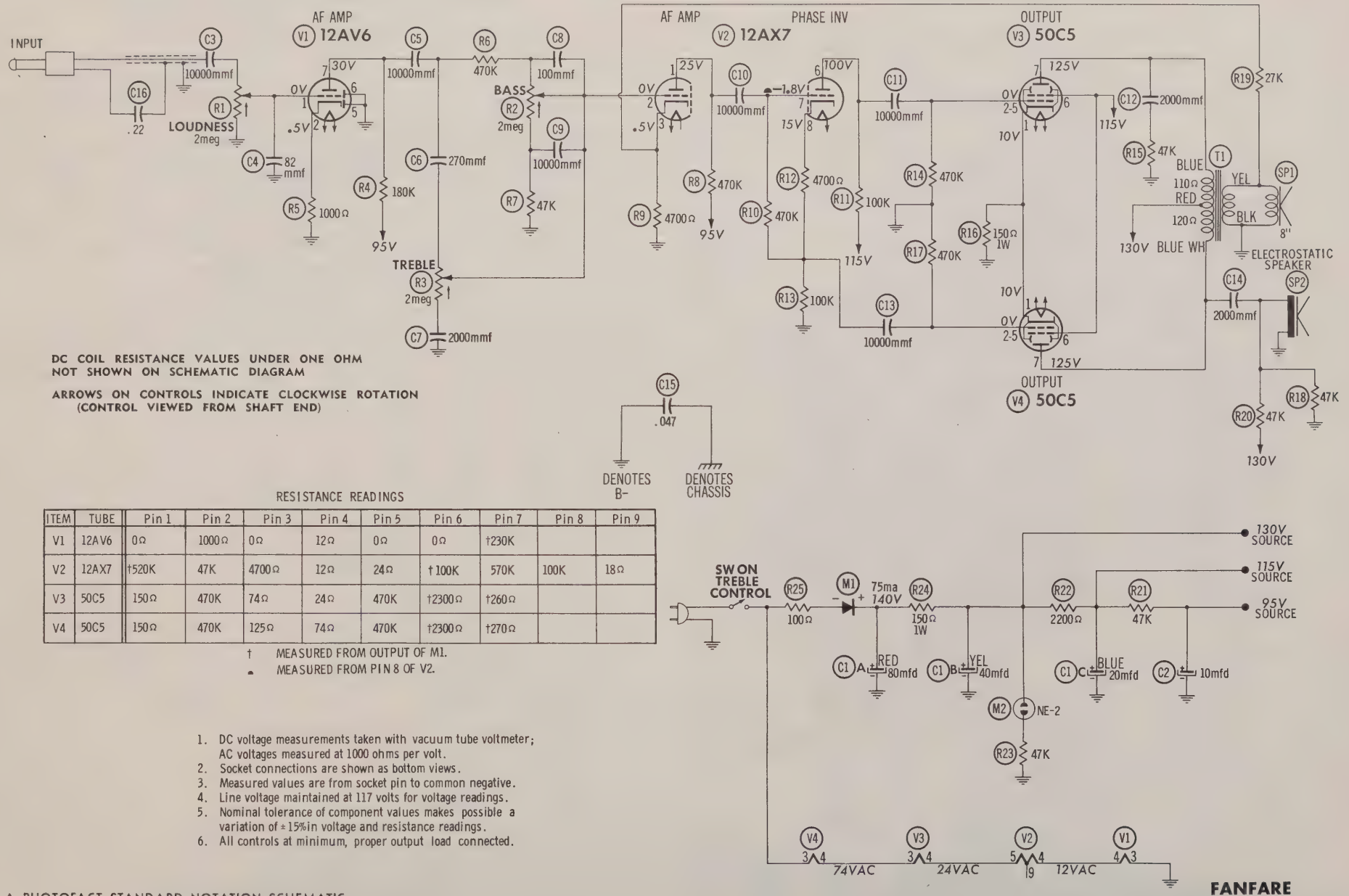
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AV6	0Ω	1000Ω	0Ω	12Ω	0Ω	0Ω	†230K		
V2	12AX7	†520K	47K	4700Ω	12Ω	24Ω	† 100K	570K	100K	18Ω
V3	50C5	150Ω	470K	74Ω	24Ω	470K	†2300Ω	†260Ω		
V4	50C5	150Ω	470K	125Ω	74Ω	470K	†2300Ω	†270Ω		

† MEASURED FROM OUTPUT OF M1.
▪ MEASURED FROM PIN 8 OF V2.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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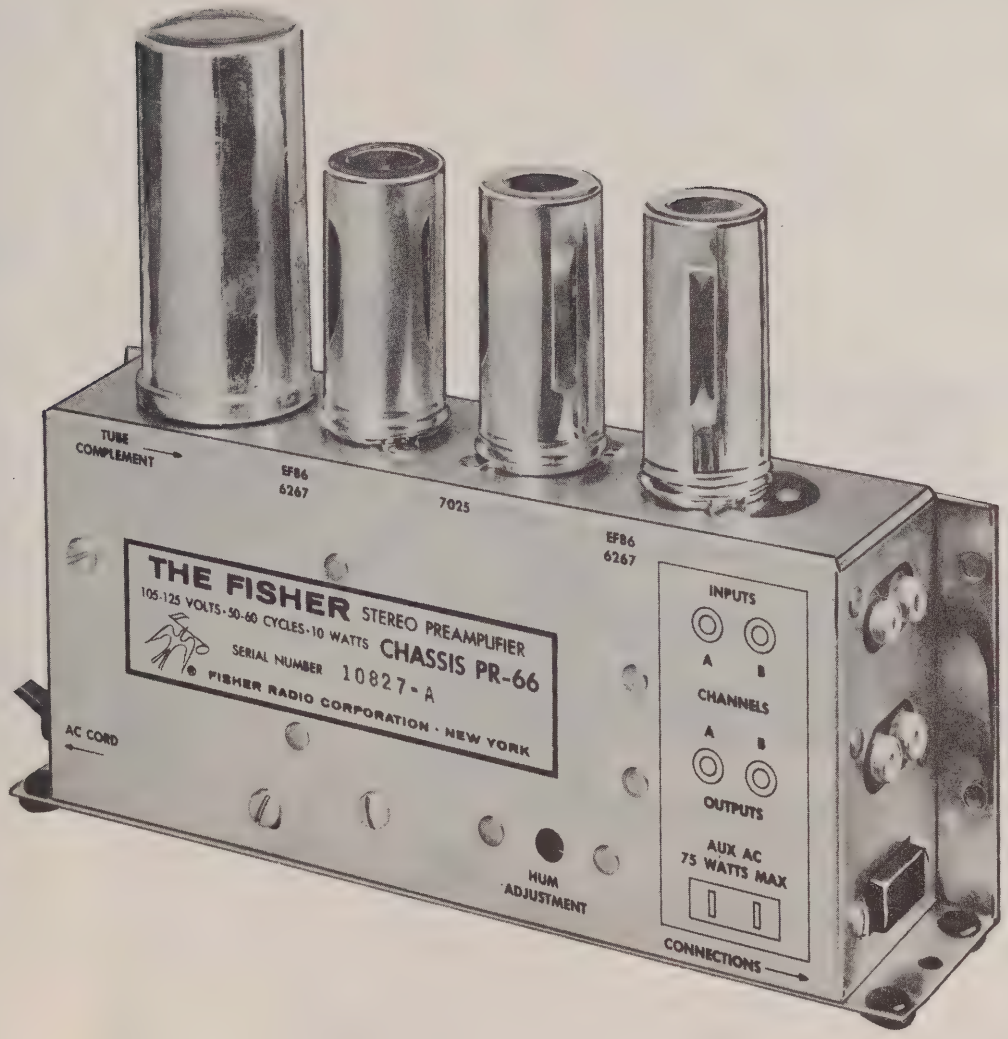
FANFARE
MODELS ST-5, ST-10

PHOTOFACT* Folder

FISHER
MODEL PR-66

FISHER
MODEL PR-66



FISHER
MODEL PR-66

TRADE NAME	Fisher Model PR-66
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.
TYPE SET	AC Operated 3 Tube Stereo Preamplifier
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 9 Watts, .125 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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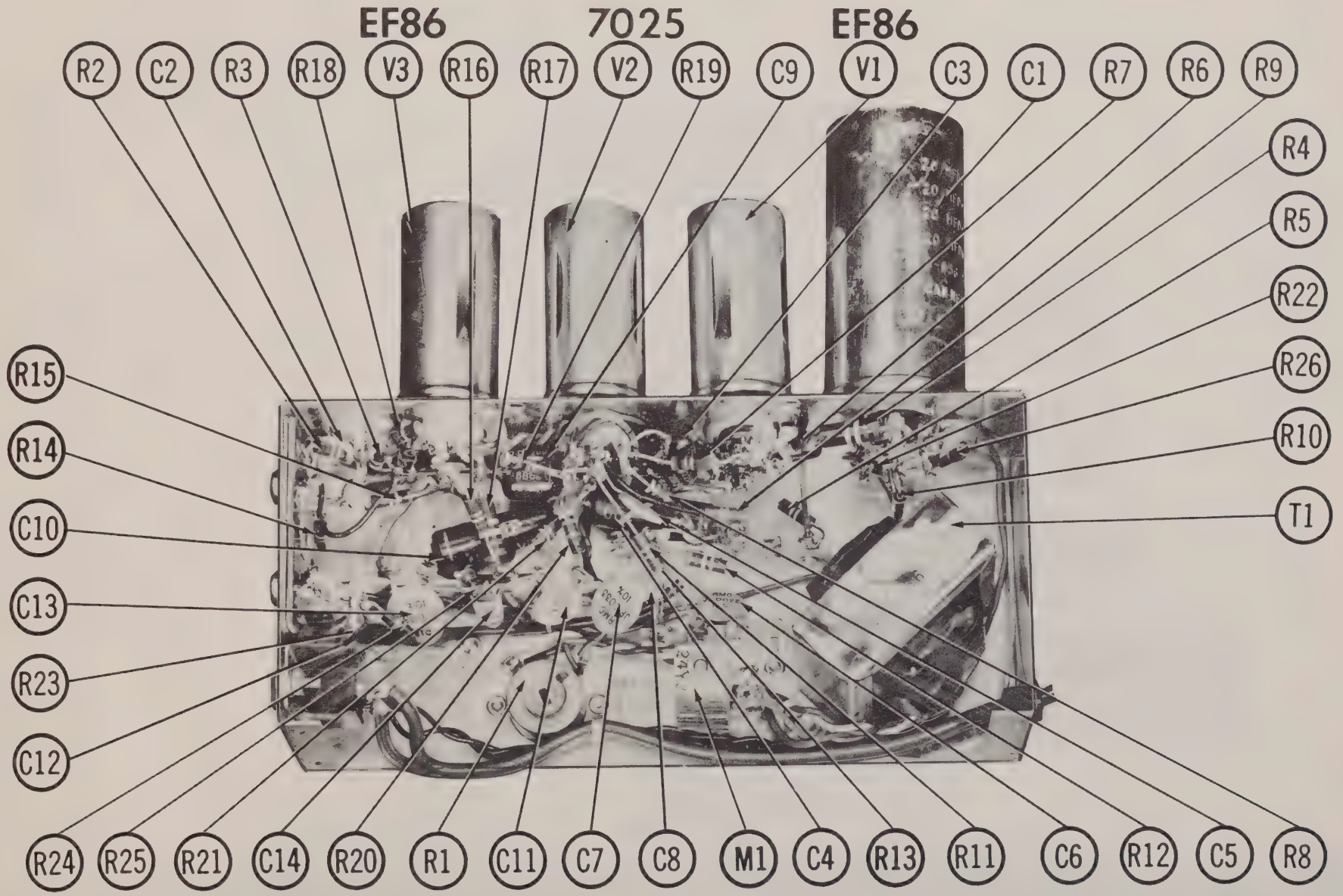


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Channel "B" Preamp.	EF86/6267	
V2A	Channel "B" Preamp.	7025	
V2B	Channel "A" Preamp.	7025	
V3	Channel "A" Preamp.	EF86/6267	

① Alternate type ECC83/12AX7.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	20	350	C-656-126	AFH4-14	D0130	FP444	TMQ-12	TVL-4763	
B	20	350							
C	20	300							
D	20	300							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100	1000	N1500	C-50070-5						
C3	.022	250		C-50074-26	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C4	.047	200		C68P473K2	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C5	10000			C-50089-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C6	2200	1000	10%	C-50072-5				JL-222	5HK-D22S 10%*	
C7	3300	1000	10%	C-50072-11				JL-233	5HK-D33S 10%*	
C8	680	1000	10%	C-50072-2		D6-681		JL-368	10GAB-T68S 10%*	
C9	.022	250		C-50074-26	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C10	.047	200		C68P473K2	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C11	10000			C-50089-3	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	2200	1000	10%	C-50072-5				JL-222	5HK-D22S 10%*	
C13	3300	1000	10%	C-50072-11				JL-233	5HK-D33S 10%*	
C14	680	1000	10%	C-50072-2		D6-681		JL-368	10GAB-T68S 10%*	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500Ω	1(WW)	R-516-128					Hum Adjustment

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R2	100K		RC20BF104K	
R3	10K		RC20BF103K	
R4	220K	1	RC30BF224K	
R5	220K		RC20BF224K	
R6	1000Ω		RC20BF102K	
R7	10meg		RC20BF106K	
R8	4.7meg		RC20BF475K	
R9	220K		RC20BF224K	
R10	4700Ω		RC20BF472K	
R11	22K		RC20BF223K	
R12	120K		RC20BF124K	
R13	120K		RC20BF124K	
R14	100K		RC20BF104K	

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R15	10K		RC20BF103K	
R16	220K	1	RC30BF224K	
R17	220K		RC20BF224K	
R18	1000Ω		RC20BF102K	
R19	10meg		RC20BF106K	
R20	4.7meg		RC20BF475K	
R21	220K		RC20BF224K	
R22	4700Ω		RC20BF472K	
R23	22K		RC20BF223K	
R24	120K		RC20BF124K	
R25	120K		RC20BF124K	
R26	4700Ω		RC20BF472K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .125A	340 VCT @ .004A	6.3VCT @ .9A	T-699-115						

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA FISHER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.004A	SR-3283		60-9150 ①	026-18C1-Q	① 2 Used

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

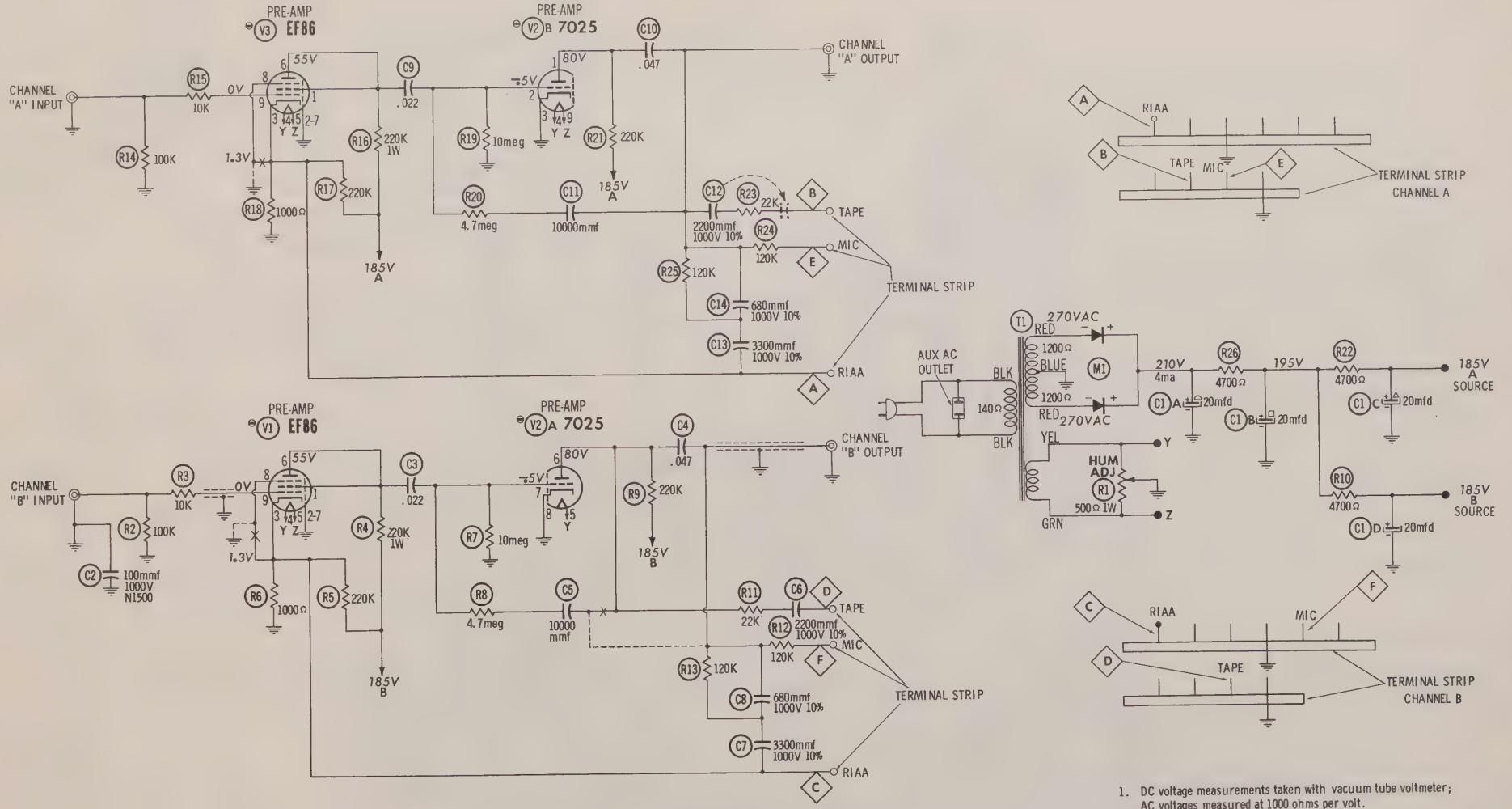
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

TAPE, STEREO AND/OR MONAURAL

To use with a stereo tape deck, make the following circuit changes: Convert channel "A" by unsoldering the violet wire from point A and resoldering to point B . Convert channel "B" by unsoldering violet wire from point C and resoldering to point D . When the unit is to be used with a monaural tape deck, make the change only on the channel to be used for the tape deck.

MICROPHONE

To use channel "A" as a preamplifier for microphone, unsolder violet wire from point A and resolder to point E . If both channels are to be used as preamplifiers for microphones, unsolder violet wire from point B and resolder to point F in addition to the modification on channel "A" .



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86	†225K	0Ω	1000Ω	130Ω	130Ω	†225K	0Ω	1000Ω	110K
V2	7025	†230K	10meg	0Ω	130Ω	130Ω	†230K	10meg	0Ω	130Ω
V3	EF86	†225K	0Ω	1000Ω	130Ω	130Ω	†225K	0Ω	1000Ω	110K

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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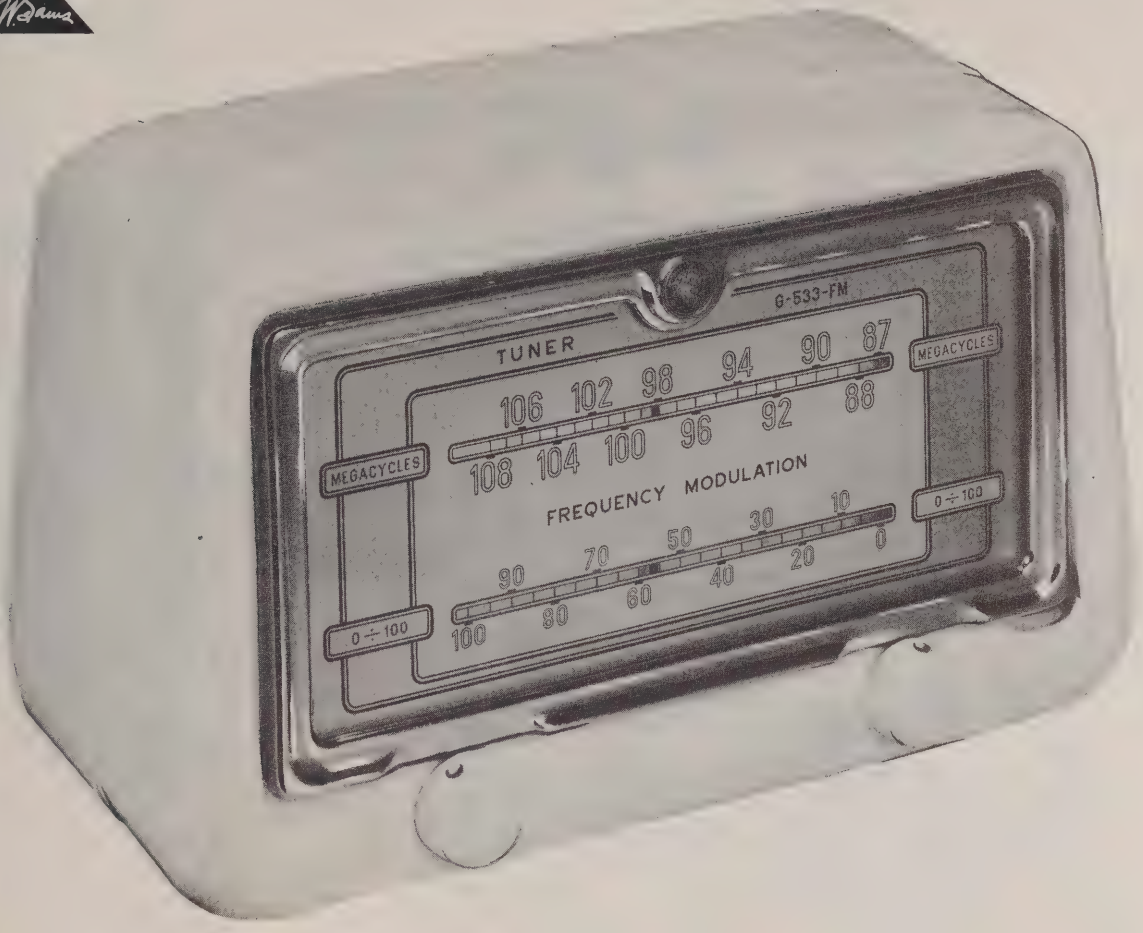
FISHER
MODEL PR-66

PHOTOFACT* Folder

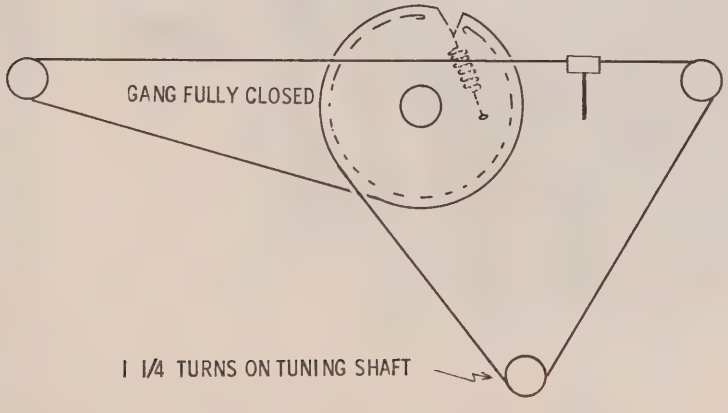
GELOSO
MODEL G-533



GELOSO
MODEL G-533

TRADE NAME	Geloso Model G-533
IMPORTER	American Geloso Electronics Inc., 312 Seventh Ave., New York 1, N. Y.
TYPE SET	AC Operated 3 Tube FM Tuner
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 16 Watts, .18 Amp. @117 Volts AC
TUNING RANGE	FREQ. MOD. 88-108MC

DIAL CORD STRINGING



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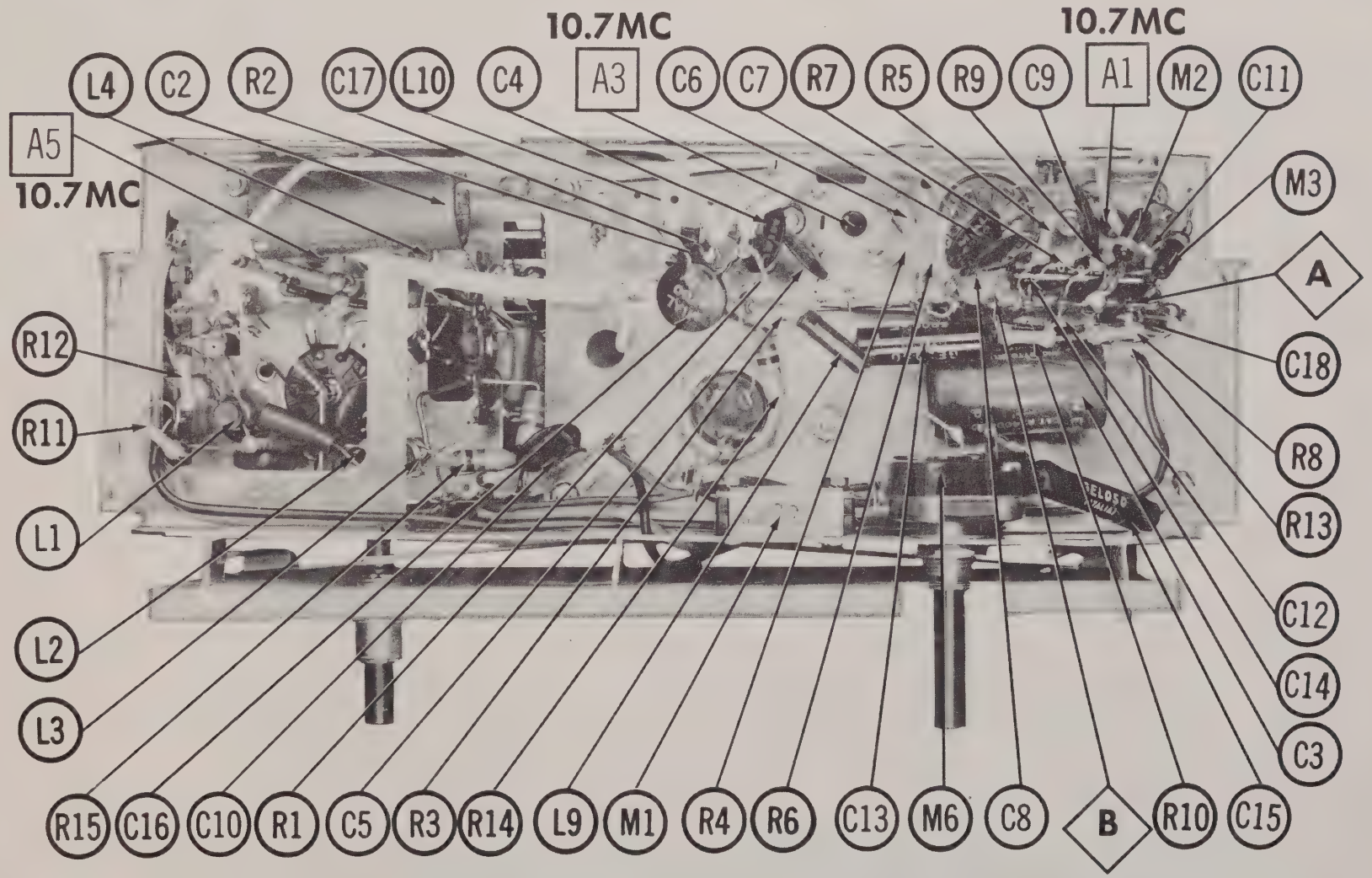
J3

SET 441 FOLDER 5



CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp. -Conv.	ECC85	
V2	1st IF Amplifier	EF89	

ITEM No.	USE	TYPE	NOTES
V3	2nd IF Amplifier	EF89	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	GELOSO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	30	250	4321		BBRD3325			R2748*	
B	30	250							
C2	16	200	4021	PRS250V16	BR1625	TC54	TD-16-250	TVA-1507	
C3	5	50	4006	PRS50V5	BBR5-50	TT50X5	TD-5-50	TVA-1303	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	GELOSO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C5	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C6	100		5%		1469-0001		22R5T1	MCE235	MS-31	
C7	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C8	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C9	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C10	.005	400			P488N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C11	.75									①
C12	500		5%		1469-0005		5R5T5	MCE245	MS-35	
C13	.005	400			P488N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C14	.1	400			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C15	.01	1500			P1688N-01	DD16-103	CUB16S1	GEM-1611	MB-S1	
C16	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	①
C17	4700				BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	①
C18	.005	400			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	①

① Not used in some versions.

RESISTORS

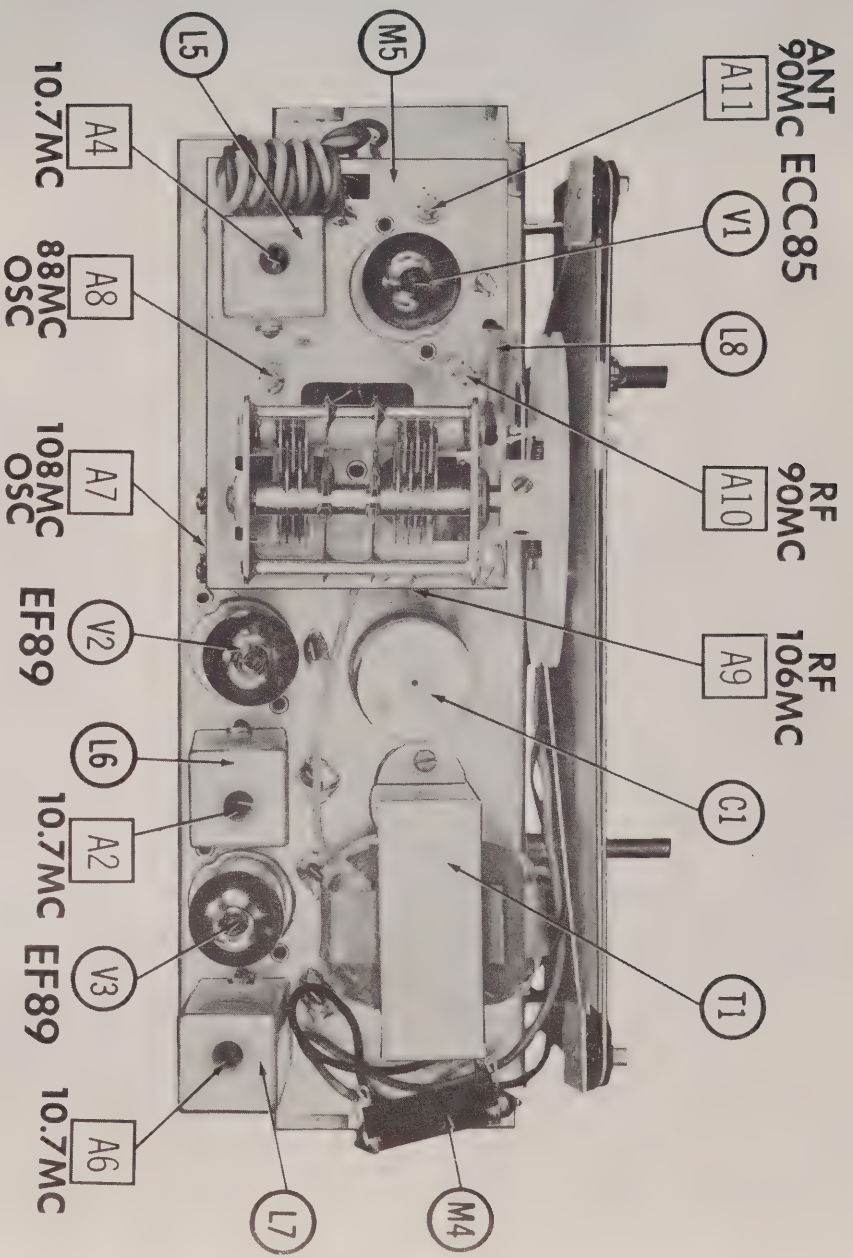
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		GELOSO PART No.	NOTES
	OHMS	WATT		
R1	47K			
R2	47Ω			
R3	100Ω			
R4	220K			
R5	47K			
R6	100Ω			
R7	10K			
R8	22K			

Note 1. Some versions may use 15K in this application.

ITEM No.	RATING		GELOSO PART No.	NOTES
	OHMS	WATT		
R9	47Ω			
R10	10K			Note 1
R11	100K			
R12	100K			
R13	100K			
R14	1000Ω			
R15	1000Ω			

CHASSIS—TOP VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow a 10 minute warm-up period for receiver and equipment. Set VTVM polarity switch to DC- position.

Suggested Alignment Tools:
A1 thru A6..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A7 thru A11..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd.	High side to pin 2 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (Unmod.)	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd.	High side to pin 2 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (450 KC SWP)	Tuning gang fully open.	Vert. Amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A6	Reconnect stabilizing capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A7	Adjust for maximum deflection.
4.	"	"	88MC	Tuning gang fully closed.	"	A8	"
5.	"	"	106MC	106MC	"	A9	"
6.	"	"	90MC	90MC	"	A10, A11	"

FIG. 1

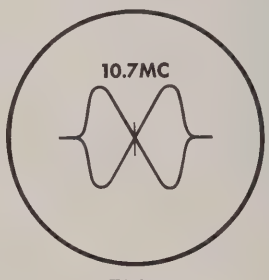
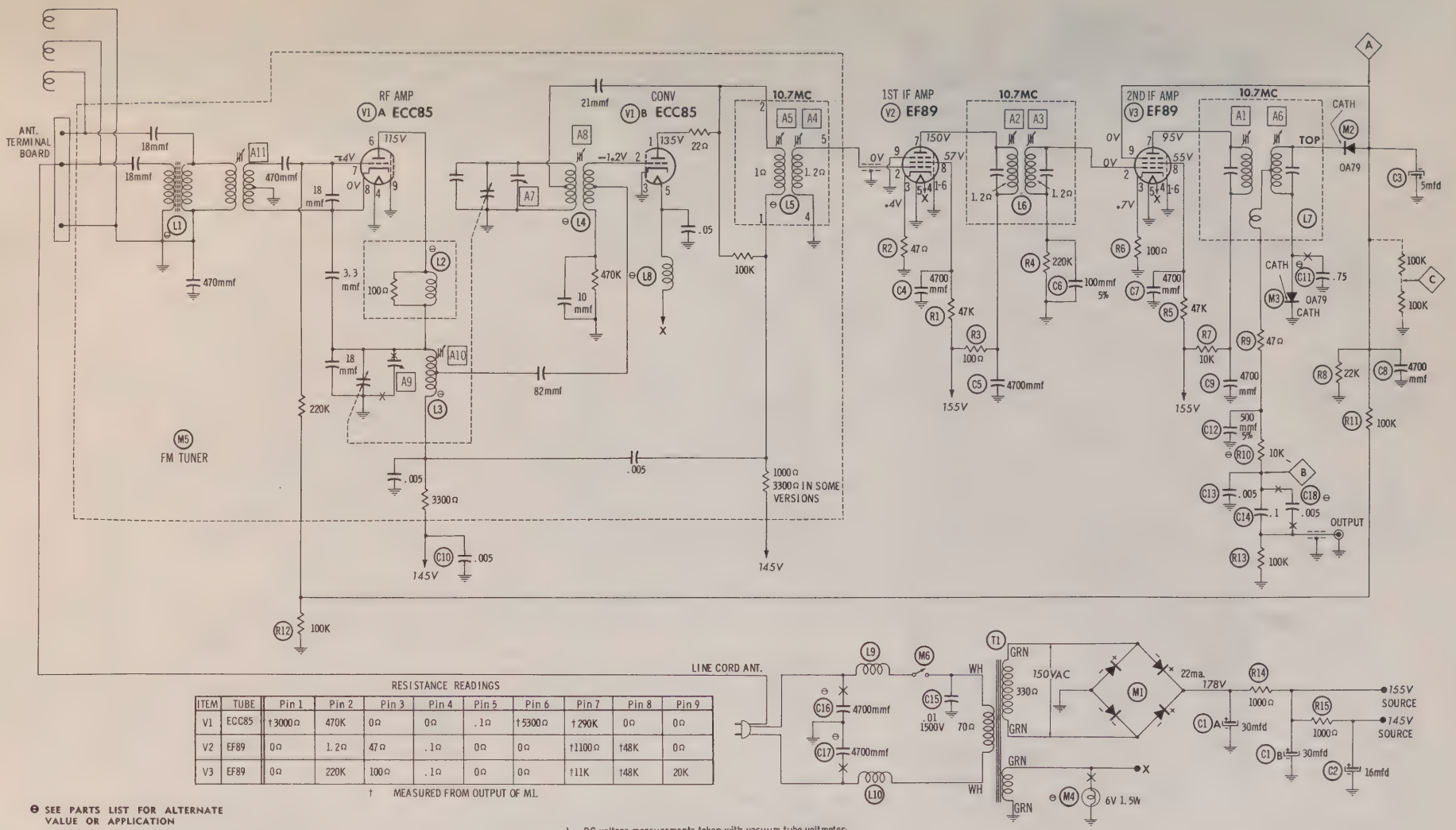


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†3000Ω	470K	0Ω	0Ω	.1Ω	†5300Ω	†290K	0Ω	0Ω
V2	EF89	0Ω	1.2Ω	47Ω	.1Ω	0Ω	0Ω	†1100Ω	†48K	0Ω
V3	EF89	0Ω	220K	100Ω	.1Ω	0Ω	0Ω	†11K	†48K	20K

† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. No signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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GELOSO MODEL G-533

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		GELOSO PART No.		Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Trans.		①					
L2	RF Choke		①					3 turns wire on 100Ω
L3	FM RF Coil		①					
L4	FM Osc. Coil		①					
L5	1st IF Trans.	2713	①					
L6	2nd IF Trans.	2717						
L7	Ratio Detector	2718						
L8	Fil. Choke	816	①	19-1003	BC-564	4608		3.8 Microhenries
L9	Line Choke	816		19-1003	BC-564	4608		3.8 Microhenries
L10	Line Choke	816		19-1003	BC-564	4608		3.8 Microhenries

① Part of RF assembly M5.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GELOSO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .18A	150V ⓐ .022A	6.3V ⓐ 1A	331/11390						

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	GELOSO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.022A	B155C90		61-1345	D-64 ①	① Silicon Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		GELOSO PART No.	CBS PART No.	SYLVANIA PART No.	
M2	0A79	0A79	1N60	1N295	Ratio Detector (Pigtail)
M3	0A79	0A79	1N60	1N295	Ratio Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	GELOSO PART No.	NOTES
M4	Lamp		6V, 1.5W, Phillips(Not used in some versions)
M5	FM Tuner	2722/108	FM
M6	Switch	631/6402B	Power-On-Off (SPST, Rotary Snap Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	74400	Tuning, Power-On-Off
Cabinet	74744-74386	Includes Back Covers
Cabinet Front	74737	
Tuning Dial	1636	Includes Dial Chassis #18331, 2 small pulleys #74321, 2 pulley pins #63203, Tuning shaft #6327A/A, tuning shaft sleeve #63273, 2 small distance pins #63595, pointer #63557, Guide #21010, fitting #76051
Dial Crystal	1636/254	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

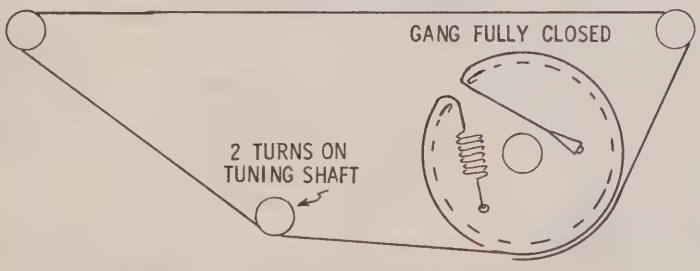
PHOTOFACT* Folder

GONSET
MODEL 3155

GONSET
MODEL 3155

TRADE NAME	Gonset Model 3155
MANUFACTURER	Gonset, Division Of L. A. Young Spring And Wire Corp., 801 S. Main St., Burbank, California
TYPE SET	AC Operated 9 Tube FM Receiver
POWER SUPPLY	110 - 120 Volts AC, 50-60 Cycles RATING 57 Watts, .55 Amp. @117 Volts AC
TUNING RANGE-FREQ. MOD.	30-50MC

DIAL CORD STRINGING



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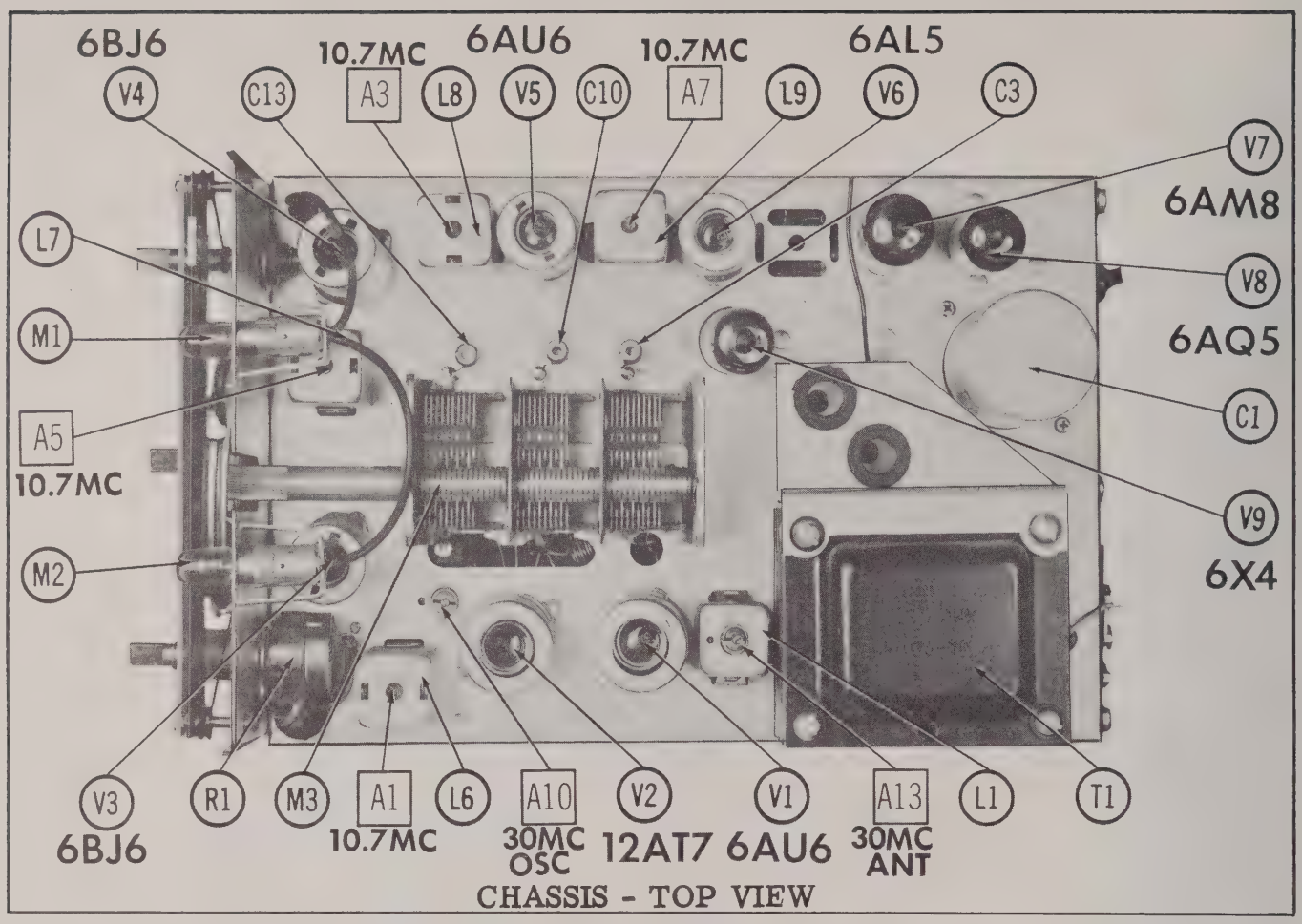
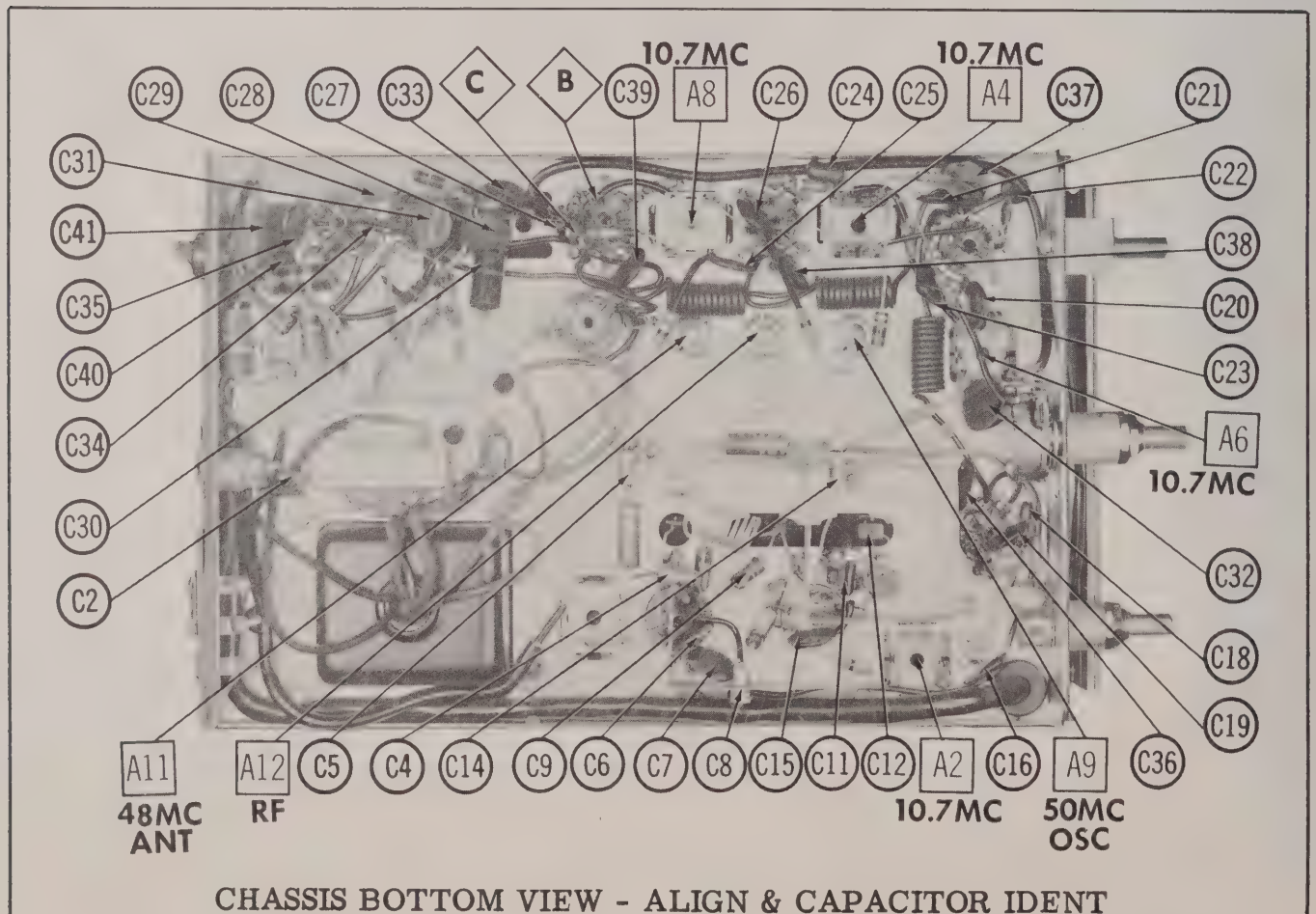


CHASSIS - TOP VIEW



CHASSIS BOTTOM VIEW - ALIGN & CAPACITOR IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6AU6	
V2	Mixer-Osc.	12AT7	
V3	1st IF Amplifier	6BJ6	
V4	2nd IF Amplifier	6BJ6	

ITEM No.	USE	TYPE	NOTES
V5	Limiter	6AU6	
V6	Discriminator	6AL5	
V7	Squelch Det. -AF Amp.	6AM8	
V8	Output	6AQ5	
V9	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	GONSET PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	▲40	450			C1480	FP384.7	TMT-154	TVLS-4708.4*		
B	■40	350			BR4035	TC78	TD-40-350			
C	▲40	350								
D	25	50								

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

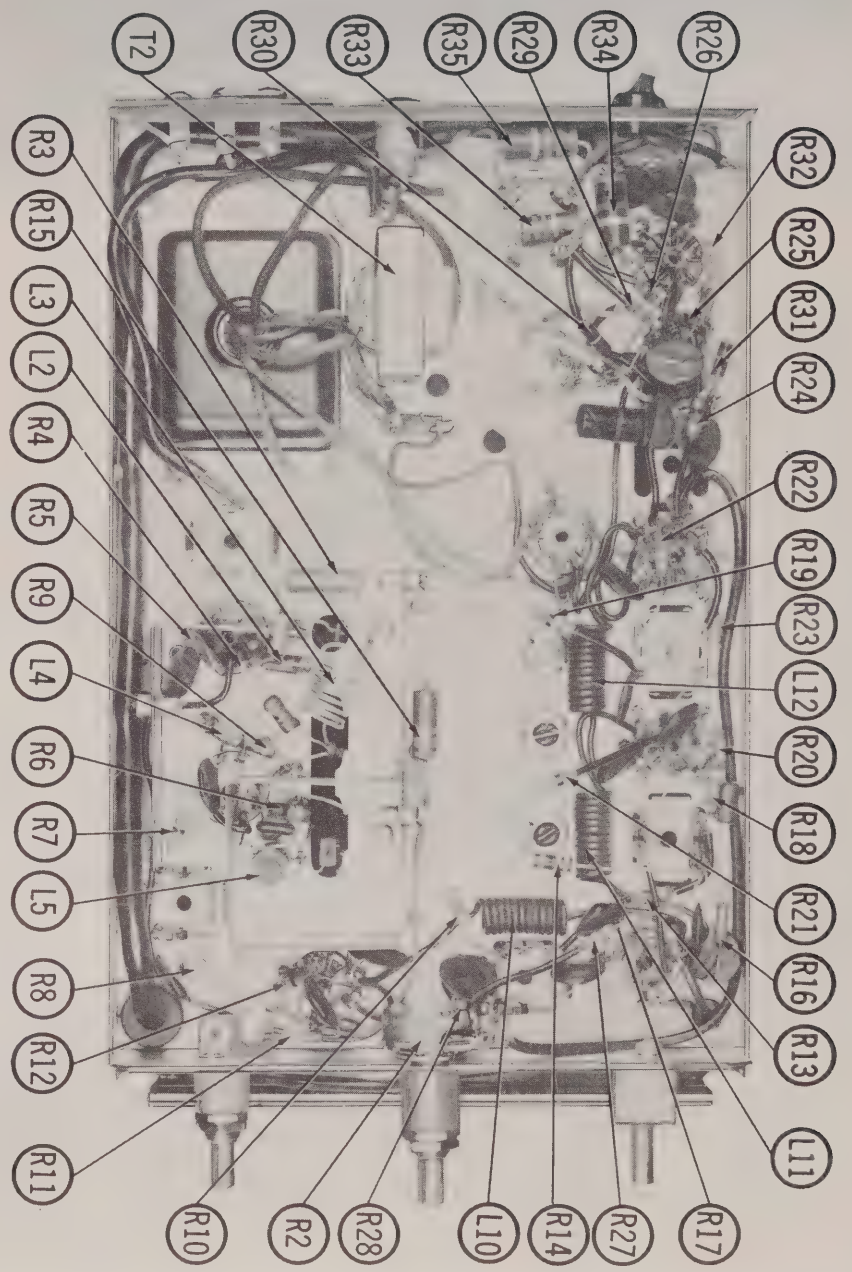
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	GONSET PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10		NPO		NPO-SI 10	DTZ-10	CTA6Q1C	ZT-541	5TCC-Q1	Note 2
C3	1-8									
C4	1000				EF-001	MFT-1000			503C-D1	
C5	1000				EF-001	MFT-1000			503C-D1	
C6	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C7	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	1000				EF-001	MFT-1000			503C-D1	
C9	10				SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C10	1-8									
C11	62		5%		1469-000062	TCZ-62	22R5Q62		MS-462	
C12	150				1469-00015	DD-151	22R5T15		MS-315	
C13	1-8									
C14	1000				EF-001	MFT-1000			503C-D1	
C15	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C16	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C18	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C19	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C20	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C23	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	100				SI 100	D6-101	L10T1	CNO-310	5GA-T1	
C25	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	Note 1
C26	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	Note 1
C27	1000				BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C28	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C29	470				BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C30	.047	200			P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C31	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C36	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C38	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C40	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C41	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	

Note 1. Some versions may use 1000mmf in this application.
Note 2. Not used in some versions.

CHASSIS-BOTTOM VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A6.....GENERAL CEMENT #5097, 8727
WALSCO #2515

A7, A8, A10, A13.....GENERAL CEMENT #8721, 8722
WALSCO #2519

A9, A11, A12.....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd.	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	"	"	"	"	DC probe thru 1meg to point Ⓑ. Common to chassis.	A7	"
3.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd.	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC SWP)	Point of non-interference.	Vert. amp to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	Vert. amp. thru 27K to point Ⓑ. Low side to chassis.	A7	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
3.	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A8	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

A9 and A12 should be adjusted with chassis in the cabinet. Openings in the cabinet are provided, A9 being nearest the front panel.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	50Ω Carbon Resistor	High side to antenna receptacle. Low side to chassis.	50MC (Unmod.)	50MC	DC probe to point Ⓐ. Common to chassis.	A9	Adjust for maximum deflection.
5.	"	"	30MC	30MC	"	A10	"
6.	"	"	48MC	Tune to 48MC signal	"	A11	"
7.				Tune to background noise.	"	A12	Adjust for maximum deflection. Repeat steps 4, 5, 6, and 7.
8.	50Ω Carbon Resistor	High side to antenna receptacle. Low side to chassis.	30MC	30MC	"	A13	Adjust for maximum deflection.

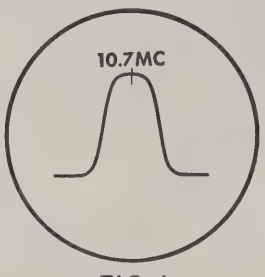


FIG. 1

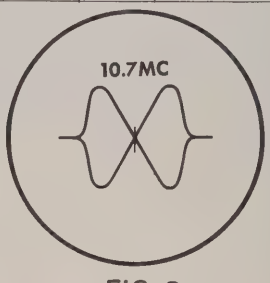
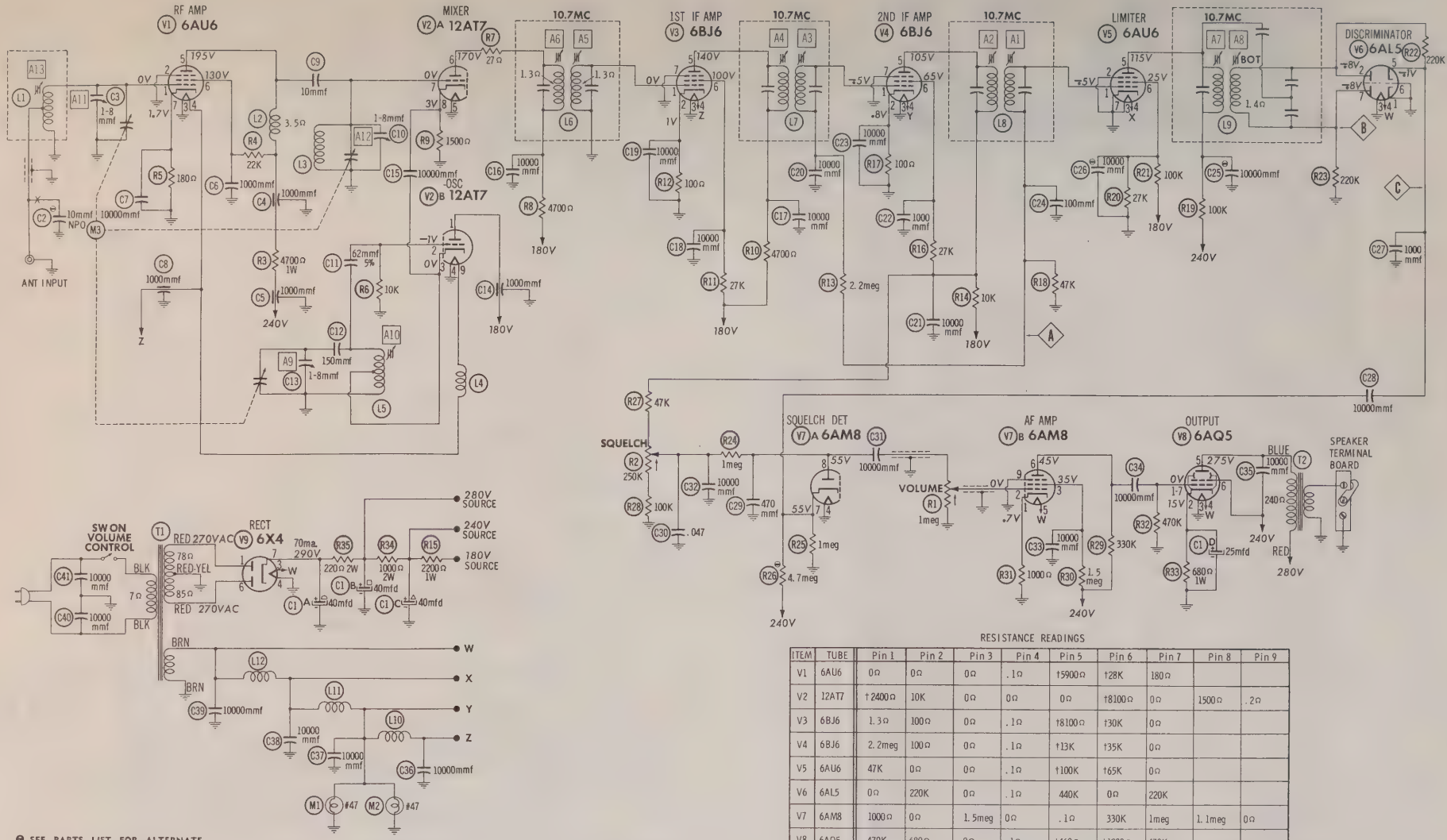


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	0Ω	0Ω	0Ω	.1Ω	†5900Ω	†28K	180Ω		
V2	12AT7	†2400Ω	10K	0Ω	0Ω	0Ω	†8100Ω	0Ω	1500Ω	.2Ω
V3	6BJ6	1.3Ω	100Ω	0Ω	.1Ω	†8100Ω	†30K	0Ω		
V4	6BJ6	2.2meg	100Ω	0Ω	.1Ω	†13K	†35K	0Ω		
V5	6AU6	47K	0Ω	0Ω	.1Ω	†100K	†65K	0Ω		
V6	6AL5	0Ω	220K	0Ω	.1Ω	440K	0Ω	220K		
V7	6AM8	1000Ω	0Ω	1.5meg	0Ω	.1Ω	330K	1meg	1.1meg	0Ω
V8	6AQ5	470K	680Ω	0Ω	.1Ω	†460Ω	†1200Ω	470K		
V9	6X4	78Ω	NC	.1Ω	0Ω	NC	85Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V9.
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1959

GONSET MODEL 3155

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GONSET PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	BL-002					Volume
B	Switch							
R2	250K		BL-001					Squelch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		GONSET PART No.	NOTES
	OHMS	WATT		
R3	4700Ω	1		
R4	22K			
R5	180Ω			
R6	10K			
R7	27Ω			
R8	4700Ω			
R9	1500Ω			
R10	4700Ω			
R11	27K			
R12	100Ω			
R13	2.2meg			
R14	10K			
R15	2200Ω	1		
R16	27K			
R17	100Ω			
R18	47K			
R19	100K			

ITEM No.	RATING		GONSET PART No.	NOTES
	OHMS	WATT		
R20	27K			
R21	100K			
R22	220K			
R23	220K			
R24	1meg			
R25	1meg			
R26	4.7meg			Note 1
R27	47K			
R28	100K			
R29	330K			
R30	1.5meg			
R31	1000Ω			
R32	470K			
R33	680Ω	1		
R34	1000Ω	2		
R35	220Ω	2		

Note 1. Some versions may use 2.2meg in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		GONSET PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil						
L2	RF Choke			TV-192	6152		18.7 Microhenries
L3	RF Coil						1.9 Microhenries
L4	Fil. Choke						
L5	Osc. Coil						
L6	1st IF Trans.		16-3487	FM-254	1463		
L7	2nd IF Trans.		16-3487	FM-254	1463		
L8	3rd IF Trans.		16-3487.	FM-254	1463		
L9	Discriminator						1.3 Microhenries
L10	Fil. Choke						1.3 Microhenries
L11	Fil. Choke						1.3 Microhenries
L12	Fil. Choke						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GONSET PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .55A	540 VCT @ .070A	6.3V @ 3.2A	JA-001		P-3048				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	GONSET PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	JB-001		A-3026			24S48	S-6X	

MISCELLANEOUS

ITEM No.	PART NAME	GONSET PART No.	NOTES
M1	Lamp		#47
M2	Lamp		#47
M3	Tuning Cap.		3 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	218-001	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA

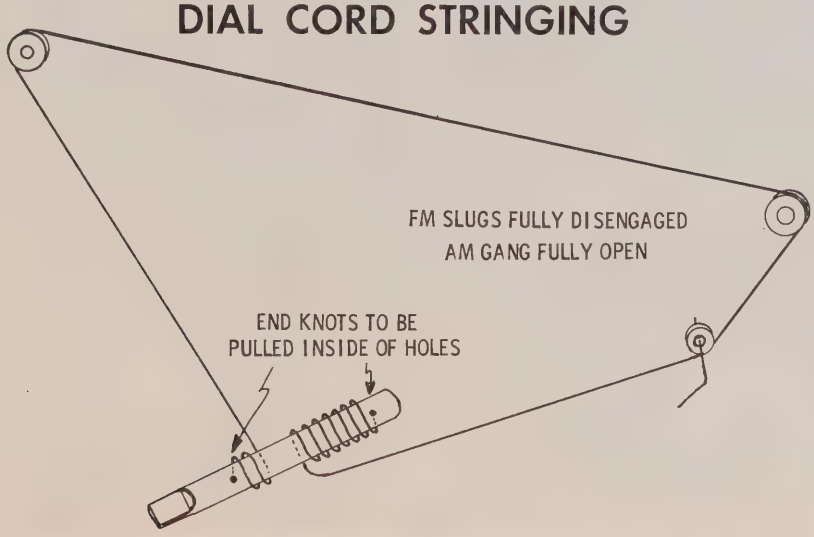
GRANCO
MODEL AT-130

GRANCO
MODEL AT-130

GRANCO
MODEL AT-130

TRADE NAME	Granco Model AT-130		
MANUFACTURER	Granco Products Inc., 36-07 20th Ave., Long Island City 5, N. Y.		
TYPE SET	AC Operated 13 Tube FM-AM Receiver		
POWER SUPPLY	105 - 120 Volts AC, 60 Cycles	RATING	88 Watts, .85 Amp. @117 Volts AC
TUNING RANGE-BROADCAST	535-1650KC	FREQ. MOD.	88 - 108MC

DIAL CORD STRINGING



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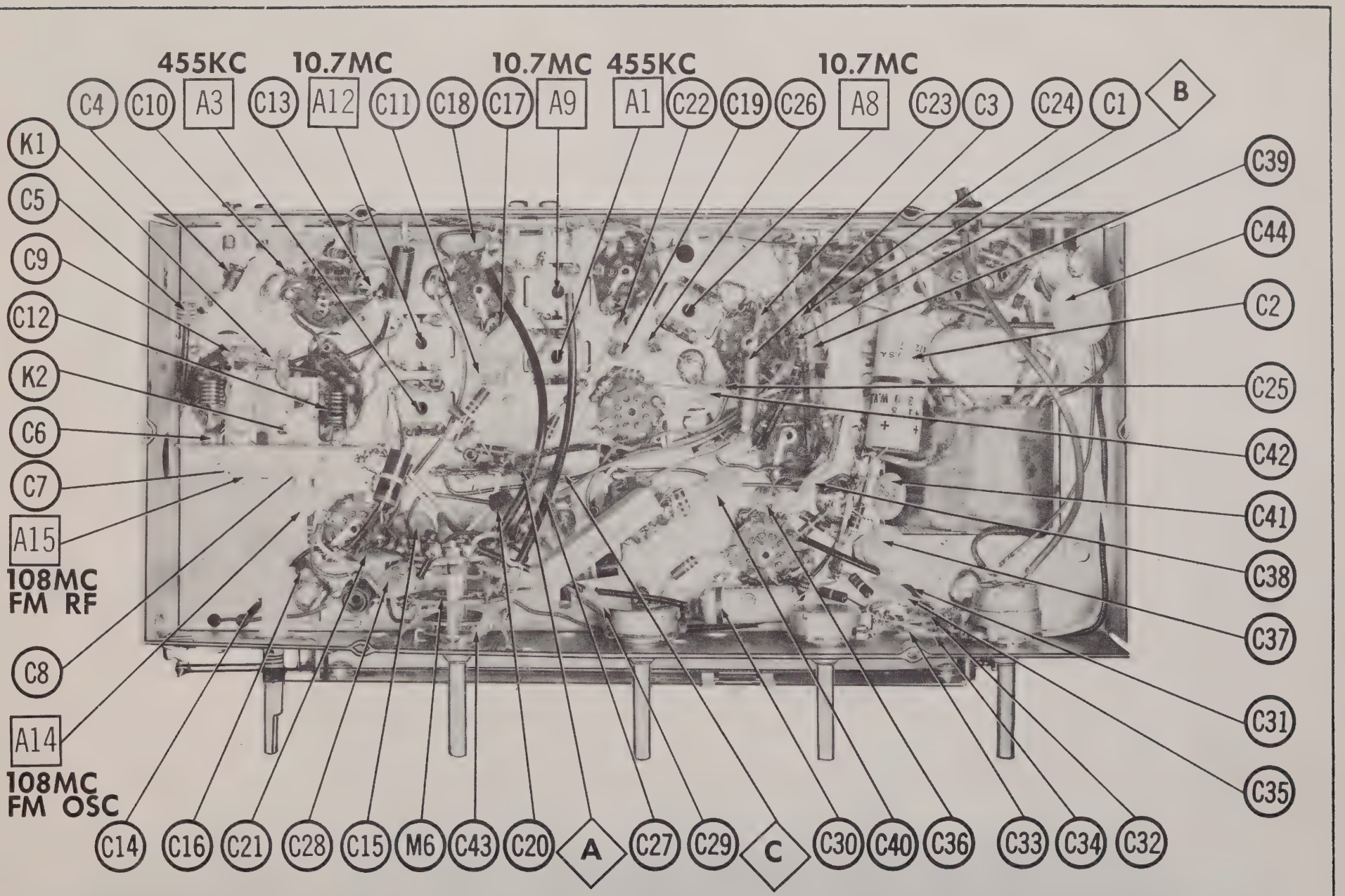
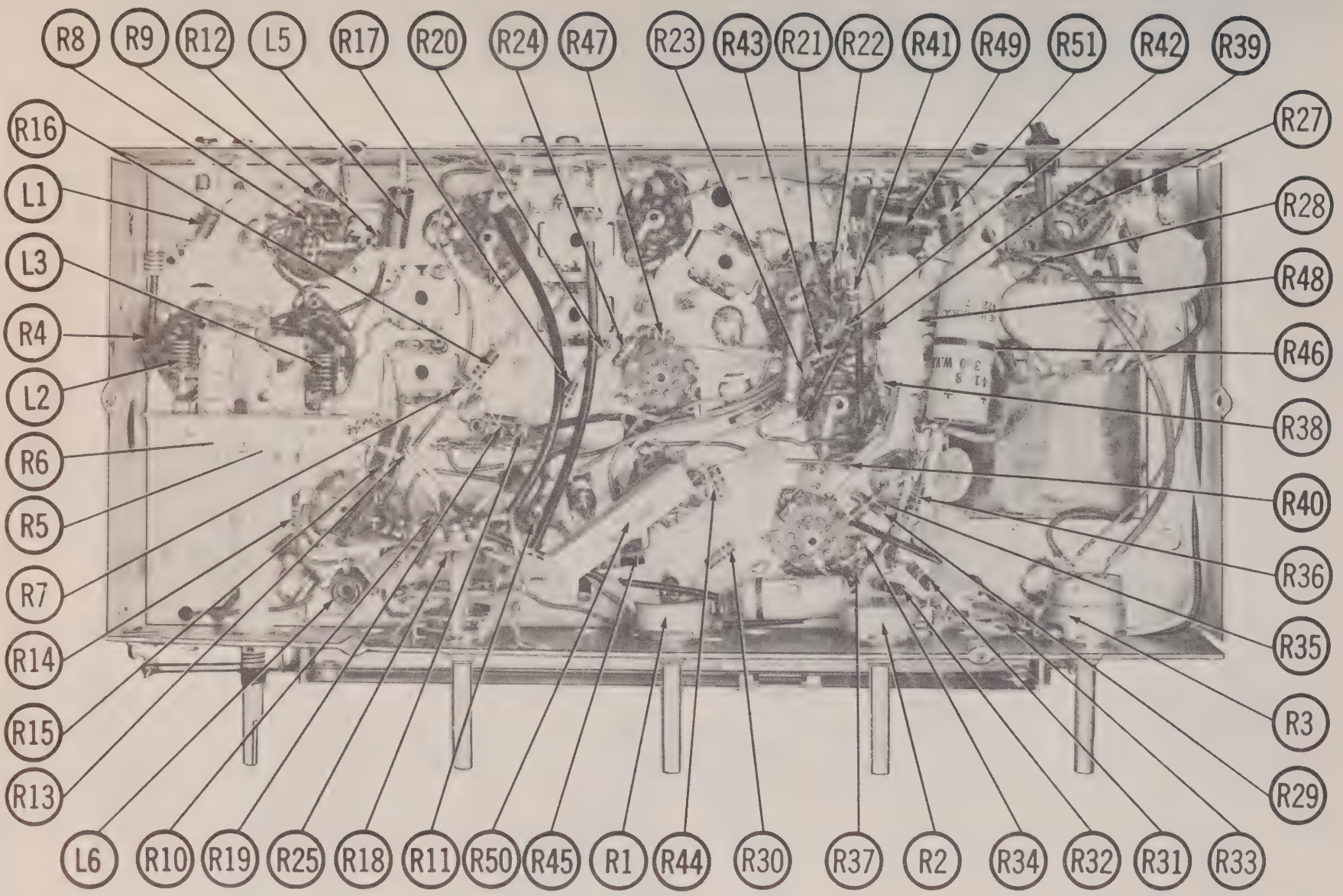
H967

SET 441 FOLDER 7

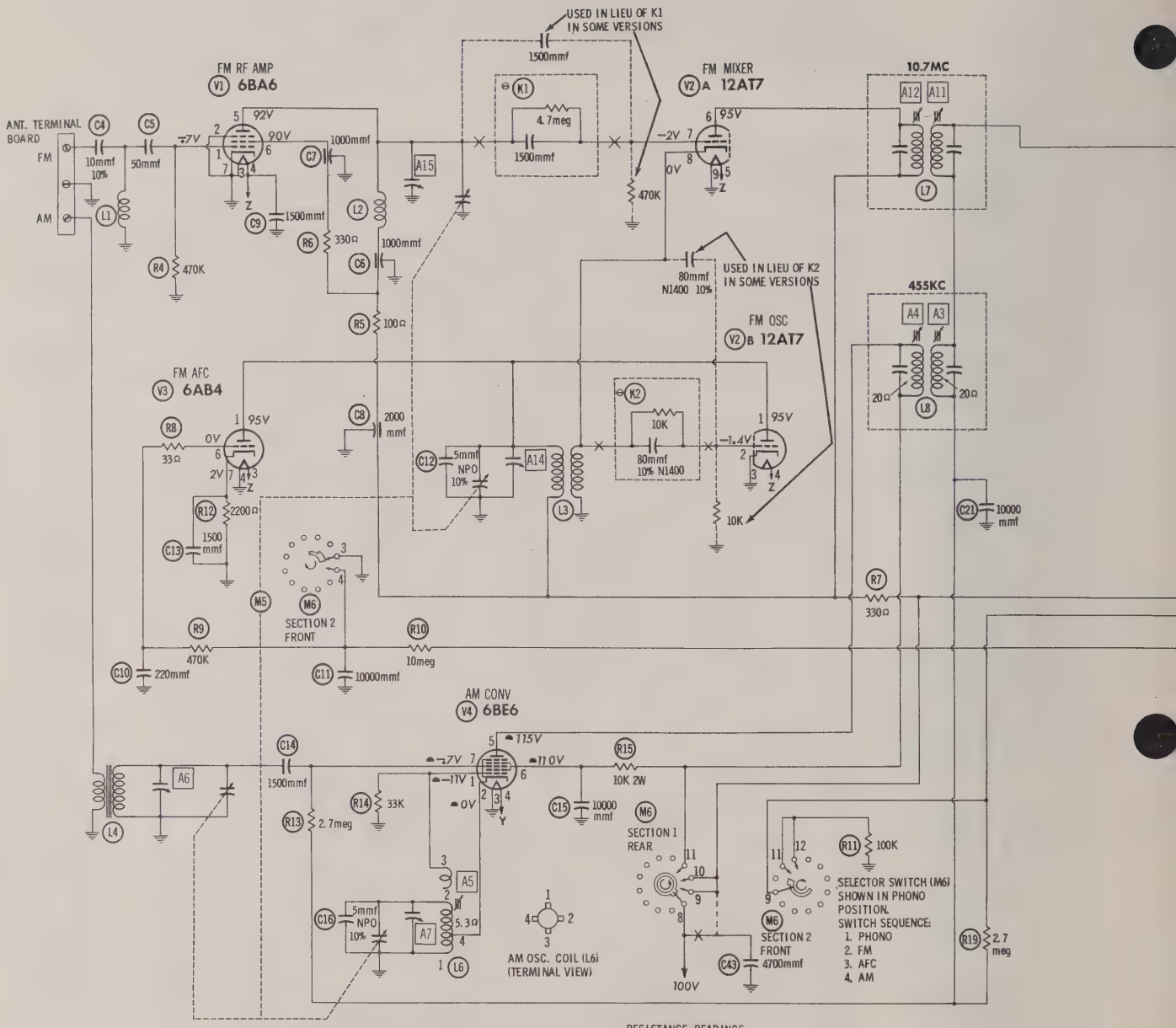


CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

GRANCO
MODEL AT-130



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	470K	0Ω	0Ω	.1Ω	†5600Ω	†5900Ω	0Ω		
V2	12AT7	†5500Ω	10K	0Ω	.1Ω	.1Ω	†5500Ω	†4.7meg	0Ω	0Ω
V3	6AB4	†5500Ω	0Ω	.1Ω	0Ω	TP	470K ▪ INF	2200Ω		
V4	6BE6	▪33K	▪3Ω	0Ω	.1Ω	▪ †5200Ω	†▪ 15K	▪ 5.5meg		
V5	6BA6	2.7meg	0Ω	.1Ω	0Ω	†10K	†10K	0Ω		
V6	6BA6	100K	0Ω	0Ω	.1Ω	†5500Ω	†5500Ω	0Ω		
V7	6AL5	10K	10K	10K	10K	10meg	0Ω	10meg		
V8	DM70 1M3	10meg	NC	NC	27Ω	0Ω	NC	NC	†1.7meg	
V9	12AU7	†20K	0Ω	330Ω	10K	10K	†67K	470K	820Ω	10K
V10	12AX7	†150K	†330K	150K	10K	10K	†330K	470K	900Ω	10K
V11	6AQ5A	470K	180Ω	10K	10K	†170Ω	†220Ω	470K		
V12	6AQ5A	470K	180Ω	10K	10K	†175Ω	†220Ω	470K		
V13	5Y3GT	TP	¶	TP	55Ω	TP	60Ω	TP	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▪ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 8 OF V13.
■ MEASURED IN "FM-AFC" POSITION.
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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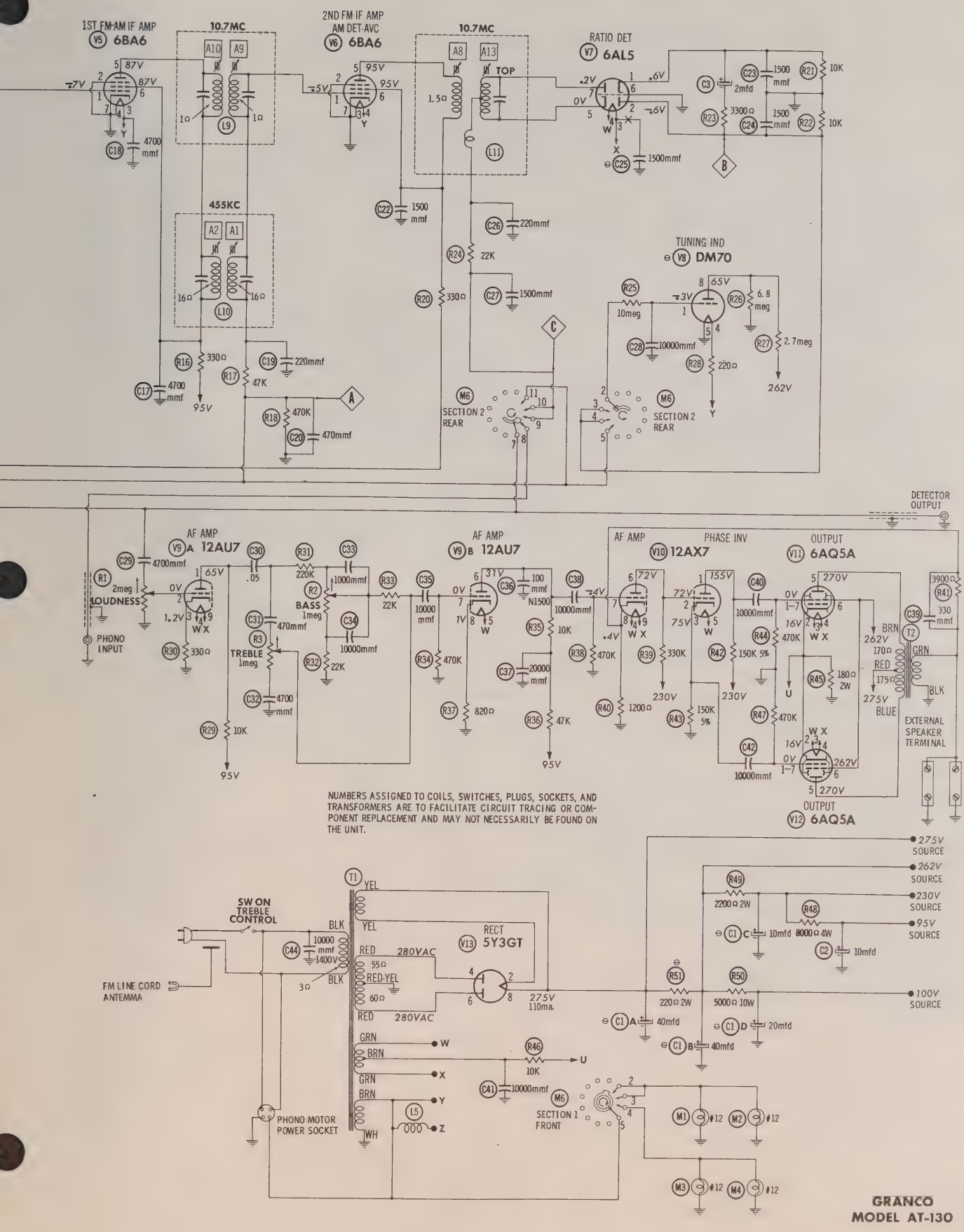

1ST FM-AM IF AMP
V5 6BA6
10.7MC
A10
A9
L9
455KC
A2
A1
L10
2ND FM IF AMP
AM DET-AVC
V6 6BA6
10.7MC
A8
A13
TOP
L11
RATIO DET
V7 6AL5
TUNING IND
V8 DM70
SECTION 2
REAR
SECTION 2
REAR
AF AMP
V9A 12AU7
AF AMP
V9B 12AU7
AF AMP
V10 12AX7
PHASE INV
OUTPUT
V11 6AQ5A
OUTPUT
V12 6AQ5A
DETECTOR
OUTPUT
LOUDNESS
BASS
TREBLE
PHONO
INPUT
EXTERNAL
SPEAKER
TERMINAL
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SW ON
TREBLE
CONTROL
FM LINE CORD
ANTEMMA
RECT
V13 5Y3GT
280VAC
280VAC
275V
110ma.
PHONO MOTOR
POWER SOCKET
SECTION 1
FRONT
275V SOURCE
262V SOURCE
230V SOURCE
95V SOURCE
100V SOURCE
GRANCO
MODEL AT-130

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A4, A8 and A13.....	GENERAL CEMENT #5097 or 8727 WALSCO #2515
A6 and A7.....	GENERAL CEMENT #5004, 5008 or 5009 WALSCO #2520
A5 and A9 thru A12.....	GENERAL CEMENT #8282, 8606, 8606L or 9295 WALSCO #2526, 2543, 2544 or 2545
A14 and A15.....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 or 8988 WALSCO #2531

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop	610KC	"	Tune to 610KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1650KC	"	Tuning gang fully open	"	A6, A7	Adjust for maximum deflection. Repeat steps 1, 2, & 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.1mfd	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.1mfd	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC SWP)	FM	Point of non-interference	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11 A12	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry simmilar to Fig. 1.
5.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A13	Reconnect C3. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	10mmf	High side to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	FM	108MC	DC probe to point Ⓑ. Common to chassis.	A14, A15	Adjust for maximum deflection.
7.	"	"	88MC	"	88MC	"	L2, L3	Adjust for maximum deflection by expanding or compressing coil turns. Repeat steps 6 and 7.

FIG. 1

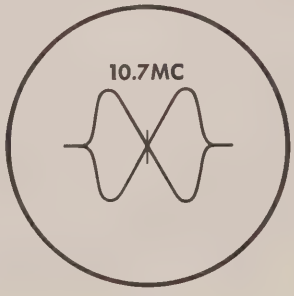


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.	6BA6	
V2	FM Mixer-FM Osc.	12AT7	
V3	FM AFC	6AB4	
V4	AM Converter	6BE6	
V5	1st FM-AM IF Amp.	6BA6	
V6	2nd FM IF Amp. -AM Det. -AVC	6BA6	

ITEM No.	USE	TYPE	NOTES
V7	Ratio Detector	6AL5	
V8	Tuning Indicator	DM70/1M3	①
V9	AF Amplifier	12AU7	
V10	AF Amp. -Phase Inv.	12AX7	
V11	Output	6AQ5A	
V12	Output	6AQ5A	
V13	Rectifier	5Y3GT	

① Domestic types listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GRANCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	41-7 ①	AFH4-18-10	C0340	FP376.9	TMT-39	TVLS-4635.12*	
B	■40	350			BR2035	TC62	TD-10-450		
C	10	350							
D	▲20	350							
C2	10	300	41-8	PRS350V10	BR1045	TC62	TD-10-450	TVA-1604	
C3	2	70		PRS50V2	BBR2-50	TT150X2	TD-2-50	TVA-1301	

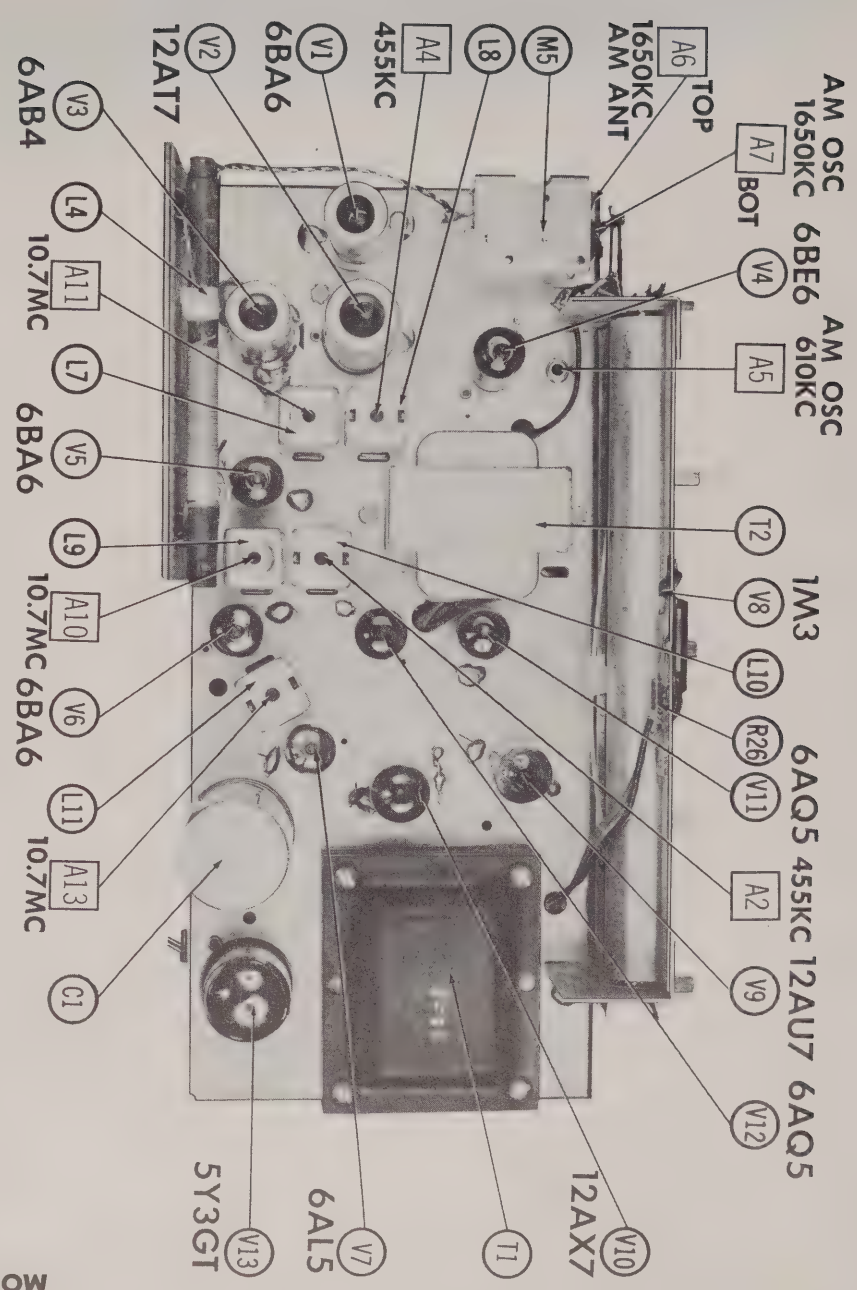
① Alternate Part #42-6
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	GRANCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	10		10%		NPO-SI 10	D6-100	CTA6Q1C	ZT-541	5GA-Q1S 10%*	
C5	50				SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C6	1000				EF-001	MFT-1000			503C-D1	
C7	1000				EF-001	MFT-1000			503C-D1	
C8	2000									
C9	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C10	220				DI-220	DD-221	L10T22	B-322	5GA-T22	
C11	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	5		10% NPO		NPO-DI 5		C10V5C		5TCCB-V5S 10%*	
C13	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C14	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C15	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C16	5		10% NPO		NPO-SI 5		C10V5C		5TCCB-V5S 10%*	
C17	4700				BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C18	4700				BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C19	220				DI-220	DD-221	L10T22	B-322	5GA-T22	
C20	470				DI-470	DD-471	BYA10T47	B-347	5GA-T47	
C21	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C23	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C24	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C25	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	①
C26	220				DI-220	DD-221	L10T22	B-322	5GA-T22	
C27	1500				BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C28	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C29	4700				BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C30	.05	400			P488N-05	DF-503	CUB-4S5	GEM-415	4TM-S5	
C31	470				DI-470	DD-471	BYA10T47	B-347	5GA-T47	
C32	4700				BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C33	1000				BPD-001	DD-102	BYA10D1	B-210	5HK-D1	
C34	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C36	100		N1500							
C37	20000				BPD-02	DD-203	BYA6S2	B-120	5HK-S2	
C38	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C39	330				BPD-00033	DD-331	L10T33	B-333	5GA-T33	

CHASSIS—TOP VIEW



GRANCO
MODEL AT-130

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C40	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C41	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C42	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C43	4700				BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C44	10000	1400			DAC-27		HVE16S1	2HV-110	20HKB-S1	

① Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GRANCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	45-13	B-76	A47-2meg-Z	Q13-139	U55	Loudness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	45-12	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	45-11A	B-697	A47-1meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power On-Off

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	GRANCO PART No.	NOTES
R4	470K			
R5	100Ω			
R6	330Ω			
R7	330Ω			
R8	33Ω			
R9	470K			
R10	10meg			
R11	100K			
R12	2200Ω			
R13	2.7meg			
R14	33K			
R15	10K	2		
R16	330Ω			
R17	47K			
R18	470K			
R19	2.7meg			
R20	330Ω			
R21	10K			
R22	10K			
R23	3300Ω			
R24	22K			
R25	10meg			
R26	6.8meg			
R27	2.7meg			

ITEM No.	RATING OHMS	RATING WATT	GRANCO PART No.	NOTES
R28	220Ω			
R29	10K			
R30	330Ω			
R31	220K			
R32	22K			
R33	22K			
R34	470K			
R35	10K			
R36	47K			
R37	820Ω			
R38	470K			
R39	330K			
R40	1200Ω			
R41	3900Ω			
R42	150K 5%			
R43	150K 5%			
R44	470K			
R45	180Ω	2		
R46	10K			
R47	470K			
R48	8000Ω	4		
R49	2200Ω	2		
R50	5000Ω	10		
R51	220Ω	2		Note 1.

Note 1. Some versions may use 200Ω in this application.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GRANCO PART No.	REPLACEMENT DATA
K1	FM Mixer Grid	4.7meg, 1500mmf ①		
K2	FM Osc. Grid	10K, 80mmf 10% N1400 ①		

① Some versions may use separate items in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA GRANCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil		19-1000	BC-561	4602		
L2	FM RF Coil						
L3	FM Osc. Coil						
L4	Loopstick	18-6					
L5	Fil. Choke		19-1002	BC-563	4606		2.2 Microhenries
L6	AM Osc. Coil	18-12-5		BC-393			
L7	1st FM IF	28-4	16-3487	FM-254	1463		
L8	1st AM IF	28-3	16-6764*	BC-352	12-C1	RF-1	* Disregard Tap
L9	2nd FM IF	28-1	16-3487	FM-254	1463		
L10	2nd AM IF	BL576	16-6758	BC-353	12-C2	RF-2	
L11	Ratio Detector	CL473	17-3498	FM-255	1465		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA GRANCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .85A	560 VCT @ .110A	5V @ 2A	33-4						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @ 1.7A	6.3V @ 1.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA GRANCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	9500Ω CT	6-8Ω	33-5A	Z1011	A-3027	AU-609	A-3870	26S59	S-55X	

MISCELLANEOUS

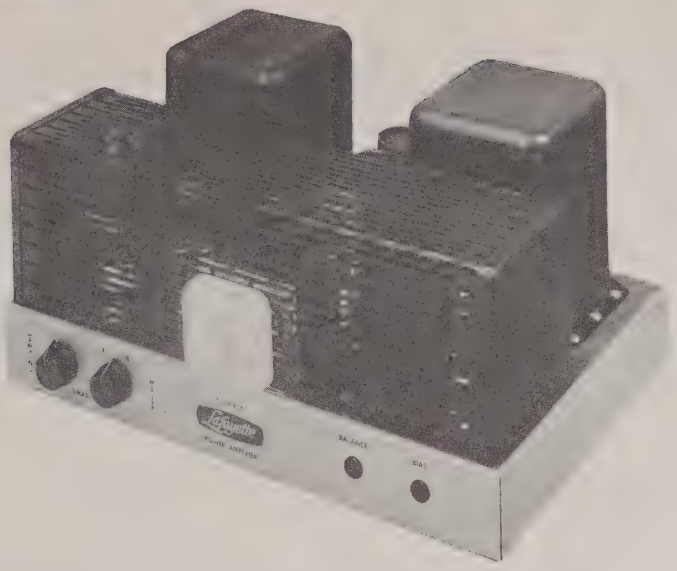
ITEM No.	PART NAME	GRANCO PART No.	NOTES
M1	Lamp		#12 FM Dial
M2	Lamp		#12 FM Dial
M3	Lamp		#12 AM Dial
M4	Lamp		#12 AM Dial
M5	Tuning Cap.		FM-AM(AM Sections: Ant. 6-208mmf, Osc. 6-97mmf.)
M6	Switch		Selector (4 Position, Rotary Wafer Type)

WIRING DATA

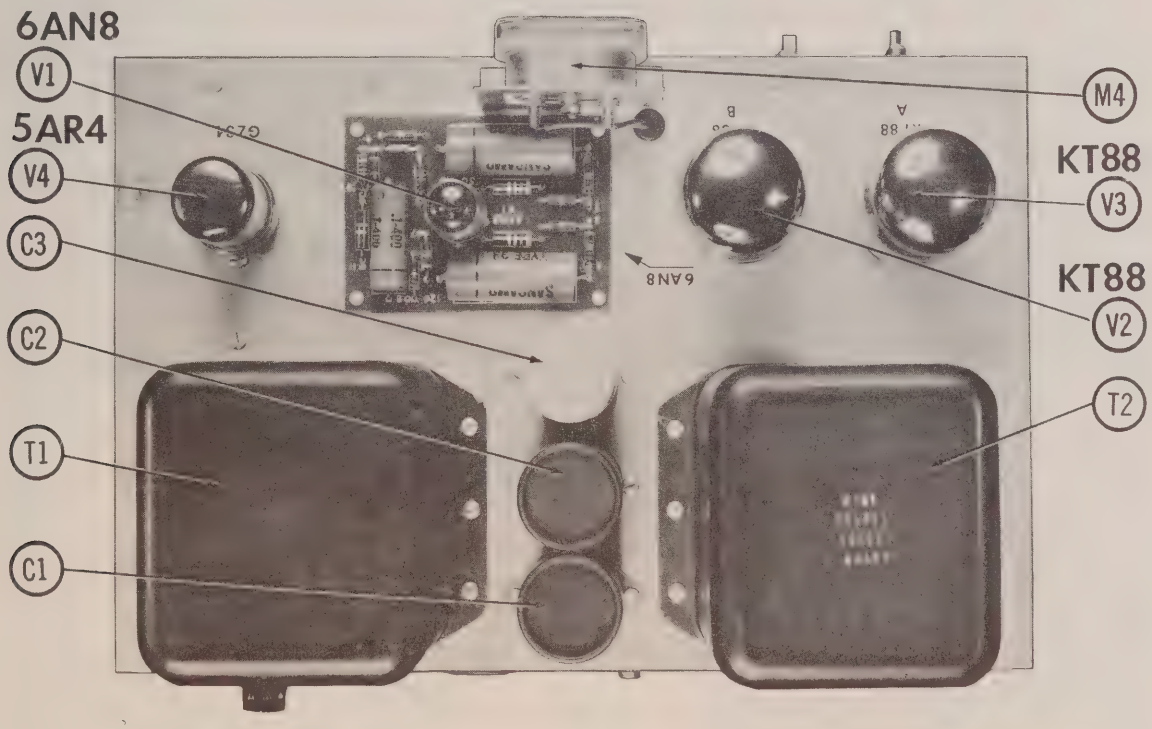
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder with CIRCUITRACE*



TRADE NAME	Lafayette Model LA-70
SUPPLIER	Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.
TYPE SET	AC Operated 70 Watt Audio Amplifier
TUBES	Four
POWER SUPPLY	105 - 125 Volts AC, 50-60 Cycles RATING 105 Watts, 1.09 Amp. @117 Volts AC



LAFAYETTE
MODEL LA-70

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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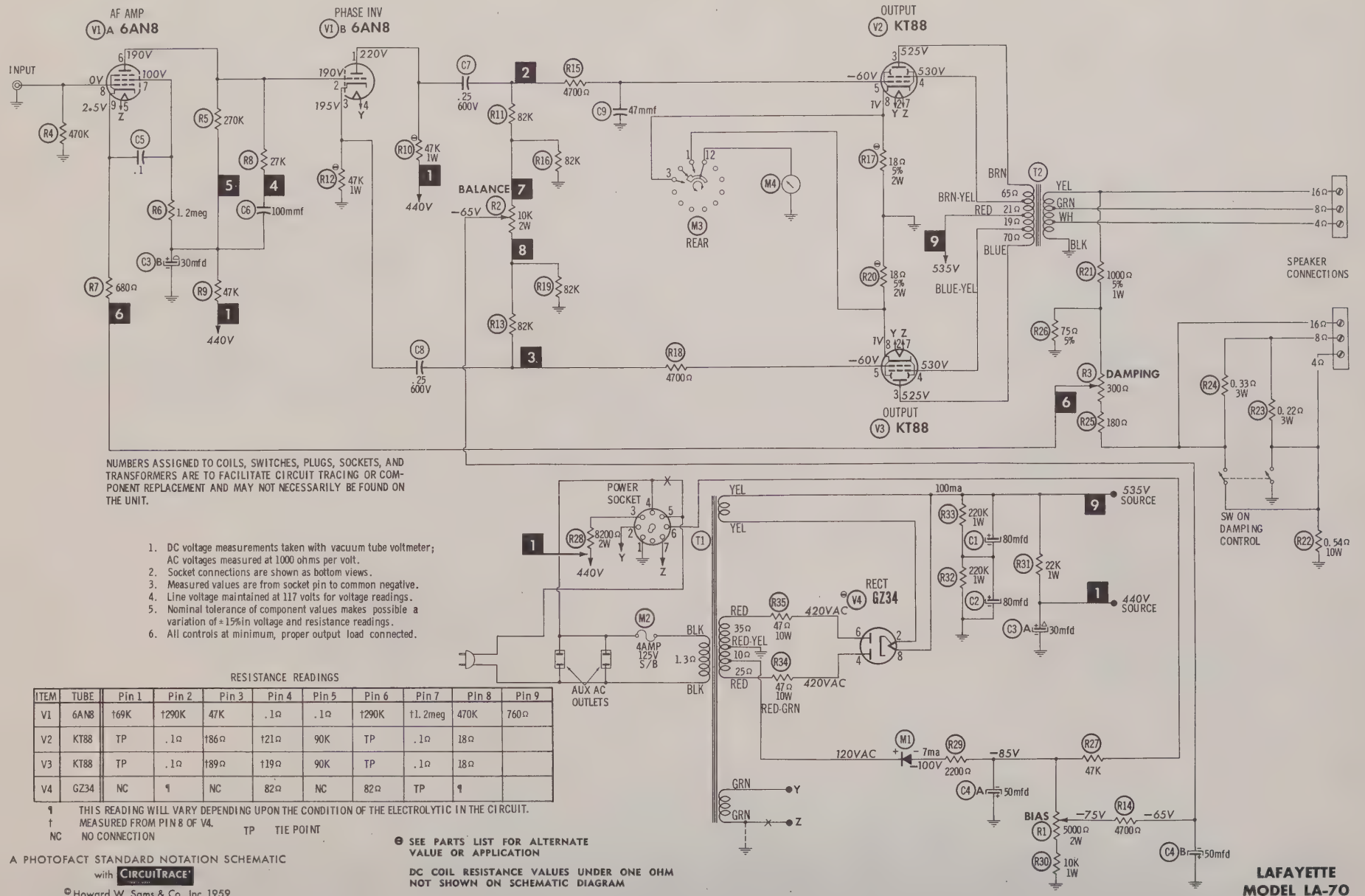
H946

SET 441 FOLDER 8



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AN8	†69K	†290K	47K	.1Ω	.1Ω	†290K	†1.2meg	470K	760Ω
V2	KT88	TP	.1Ω	†86Ω	†21Ω	90K	TP	.1Ω	18Ω	
V3	KT88	TP	.1Ω	†89Ω	†19Ω	90K	TP	.1Ω	18Ω	
V4	GZ34	NC	¶	NC	82Ω	NC	82Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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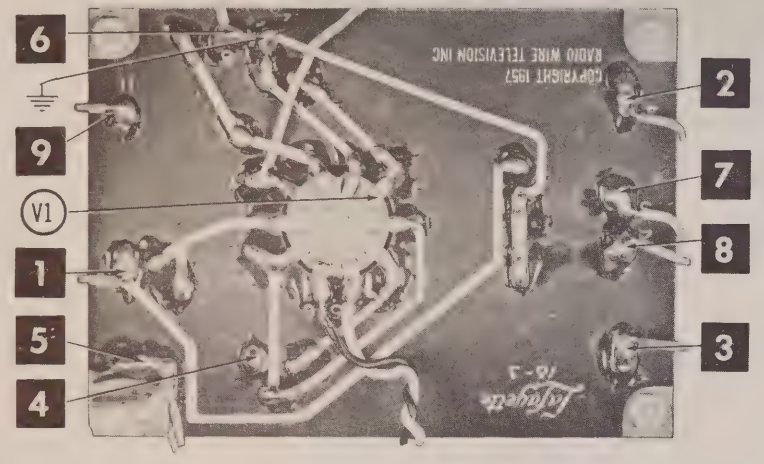
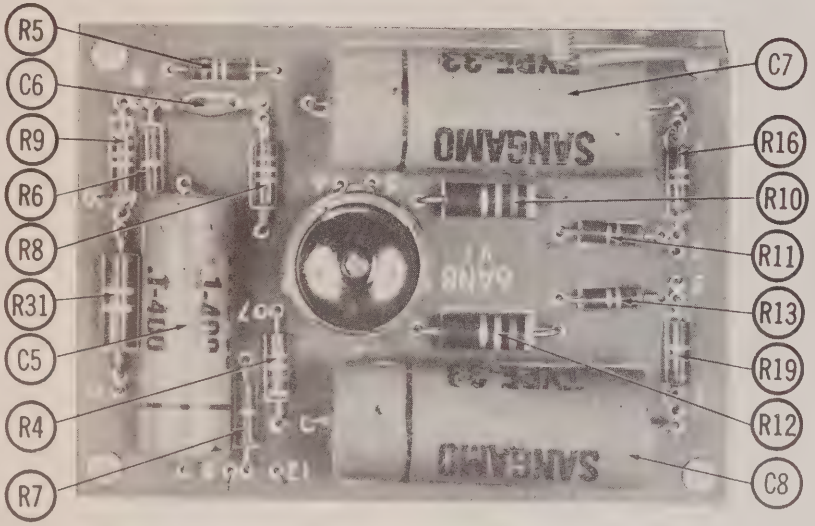
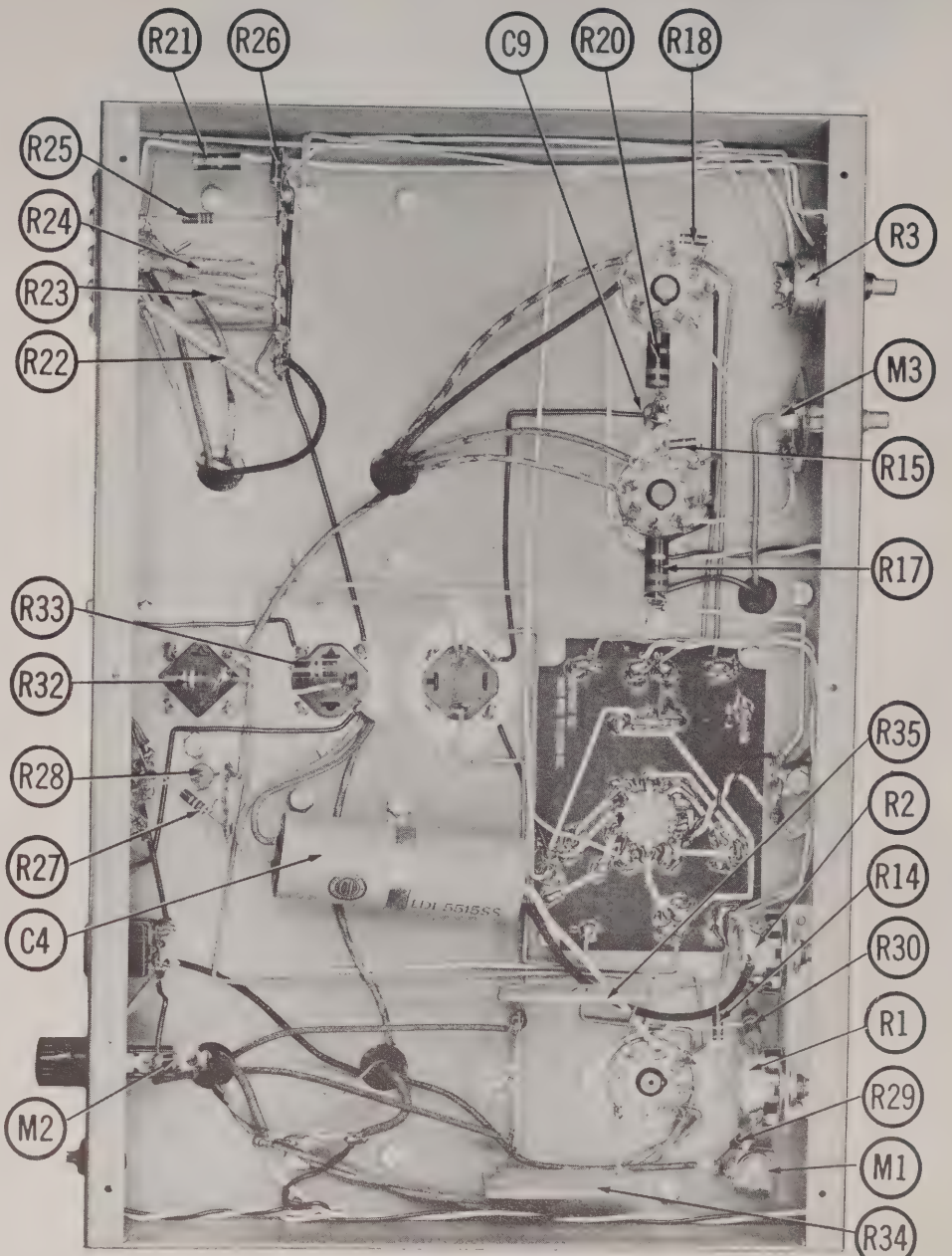
A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD





CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	6AN8	
V2	Output	KT88	
V3	Output	KT88	
V4	Rectifier	GZ34/ 5AR4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Lafayette PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	80	350	12-16	AFH1-42	A0400	FP138	TMS-47	TVL-1630	
C2	80	350	12-16	AFH1-42	A0400	FP138	TMS-47	TVL-1630	
C3A	▲30	500	12-15	AFH2-72	B0520	FP284	TMD-62	TVL-2937	
B	▲30	500			BR2050				
C4A	50	150	12-17		EDL5515SS	TCS48	TD-50-150		
B	50	150					TD-50-150		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Lafayette PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	.1	400		12-12	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C6	100			12-3	BPD-0001	DD-101	L10T1	CNO-310	5GA-T1	
C7	.25	600		12-18	P688N-25		CUB6P25	GEM-6025	6TM-P25	
C8	.25	600		12-18	P688N-25		CUB6P25	GEM-6025	6TM-P25	
C9	47			12-19	BPD-000047	DD-500	L10Q47	CNO-447	5GA-Q47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Lafayette PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5000Ω	2(WW)	11-6	WN-502	A43-5000	WPS5000	R5000L	Bias
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R2A	10K	2(WW)	11-5	WN-103	A43-10K	W11-116	R10ML	Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	
R3A	300Ω	½	11-7					Damping
B	Switch							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Lafayette PART No.	NOTES
	OHMS	WATT		
R4	470K		13-16	
R5	270K		13-17	
R6	1.2meg		13-15	
R7	680Ω		13-21	
R8	27K		13-33	
R9	47K		13-4	
R10	47K	1	13-25	①
R11	82K		13-32	
R12	47K	1	13-25	①
R13	82K		13-32	
R14	4700Ω		13-18	
R15	4700Ω		13-18	
R16	82K		13-32	
R17	18Ω 5%	2	13-37	②
R18	4700Ω		13-18	
R19	82K		13-32	

① Matched pair ② Matched pair

ITEM No.	RATING		Lafayette PART No.	NOTES
	OHMS	WATT		
R20	18Ω 5%	2	13-37	②
R21	1000Ω 5%	1	13-36	
R22	0.54Ω	10	13-31	
R23	0.22Ω	3	13-30	
R24	0.33Ω	3	13-29	
R25	180Ω		13-34	
R26	75Ω 5%		13-35	
R27	47K		13-4	
R28	8200Ω	2	13-23	
R29	2200Ω		13-19	
R30	10K	1	13-27	
R31	22K	1	13-26	
R32	220K	1	13-24	
R33	220K	1	13-24	
R34	47Ω	10	13-38	
R35	47Ω	10	13-38	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Lafayette PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ 1.09A	840VCTⓐ .100A Tap 120V ⓐ .0072A	5V ⓐ 3A	15-3						
	SEC. 3	SEC. 4	SEC. 5							
	6.3Vⓐ 3.7A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Lafayette PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3600Ω CT Screen Tapsⓐ 1100Ω CT	16Ω Tapsⓐ 8Ω, 4Ω	15-2							

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Lafayette PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.0072A	17-3	1159	D-5412	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Lafayette PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	4A 125V S/B	20-13		313004. (4A 125V S/B)	342012	MDX4	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Lafayette PART No.	NOTES
M3	Switch	14-4	Meter-A-B (2 Position, Rotary Wafer, Spring Return Type)
M4	Meter	20-17	
	Printed Board	16-3	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

BIAS (R1) AND BALANCE (R2) ADJUSTMENTS

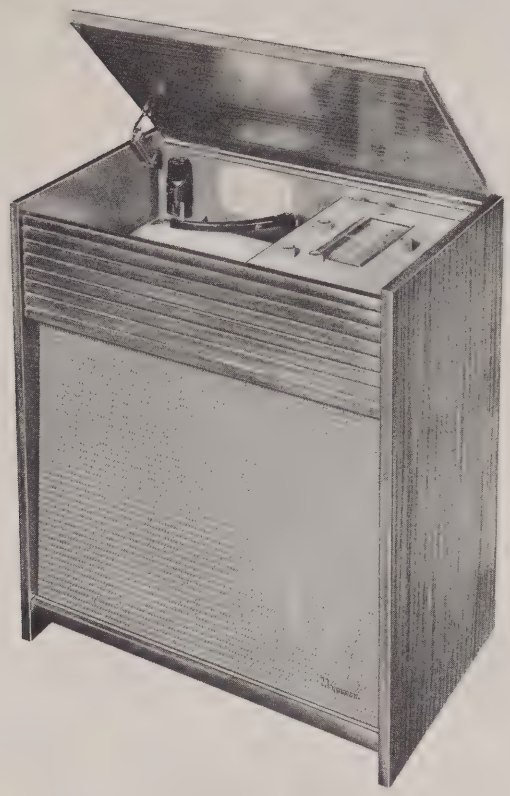
If the meter reads above 3, turn Bias counterclockwise until reading is 2. (DO NOT operate the amplifier more than a minute with meter reading above 3.) Proceed to balance.

With no signal applied, turn meter switch to position "A". If the meter reads in the white area (1-3) note the reading. Turn switch to position "B". If the meter reading is the same as "A", the tubes are balanced; if not, turn balance to make the "B" reading the same as the "A" reading. Since the control decreases one reading while increasing the other, it may be necessary to repeat this step several times to get exact balance.

PHOTOFACT* Folder with CIRCUITRACE*

MAGNAVOX CHASSIS
51-01, -02, -04, -07, -09, -11

MAGNAVOX CHASSIS
51-01, -02, -04, -07, -09, -11

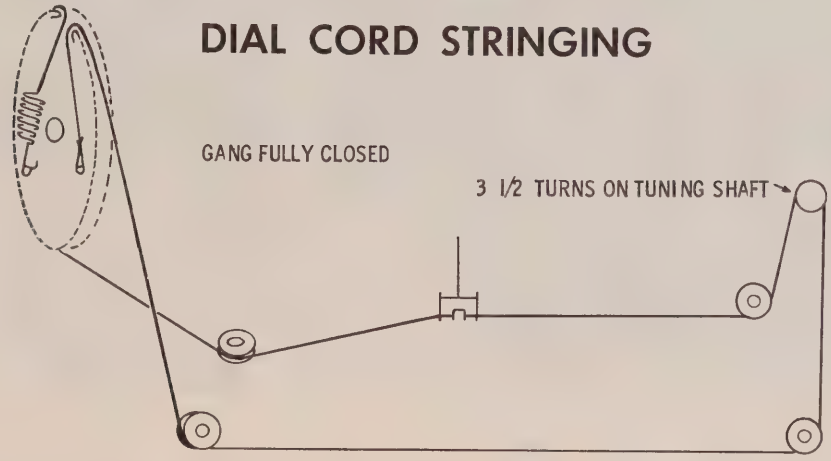


MAGNAVOX CHASSIS
51-01, -02, -04, -07, -09, -11

TRADE NAME	Magnavox Chassis 51-01, 51-02, 51-04, 51-07, 51-09, 51-11		
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana		
TYPE SET	AC Operated FM-AM Receiver With 4 Speed Automatic Record Changer		
TUBES	Eleven (Ch. 51-02 has 10)		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	90 Watts, .81 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540 - 1620KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR COLLARO RC456 - PHOTOFACT SET 342 FOLDER 3 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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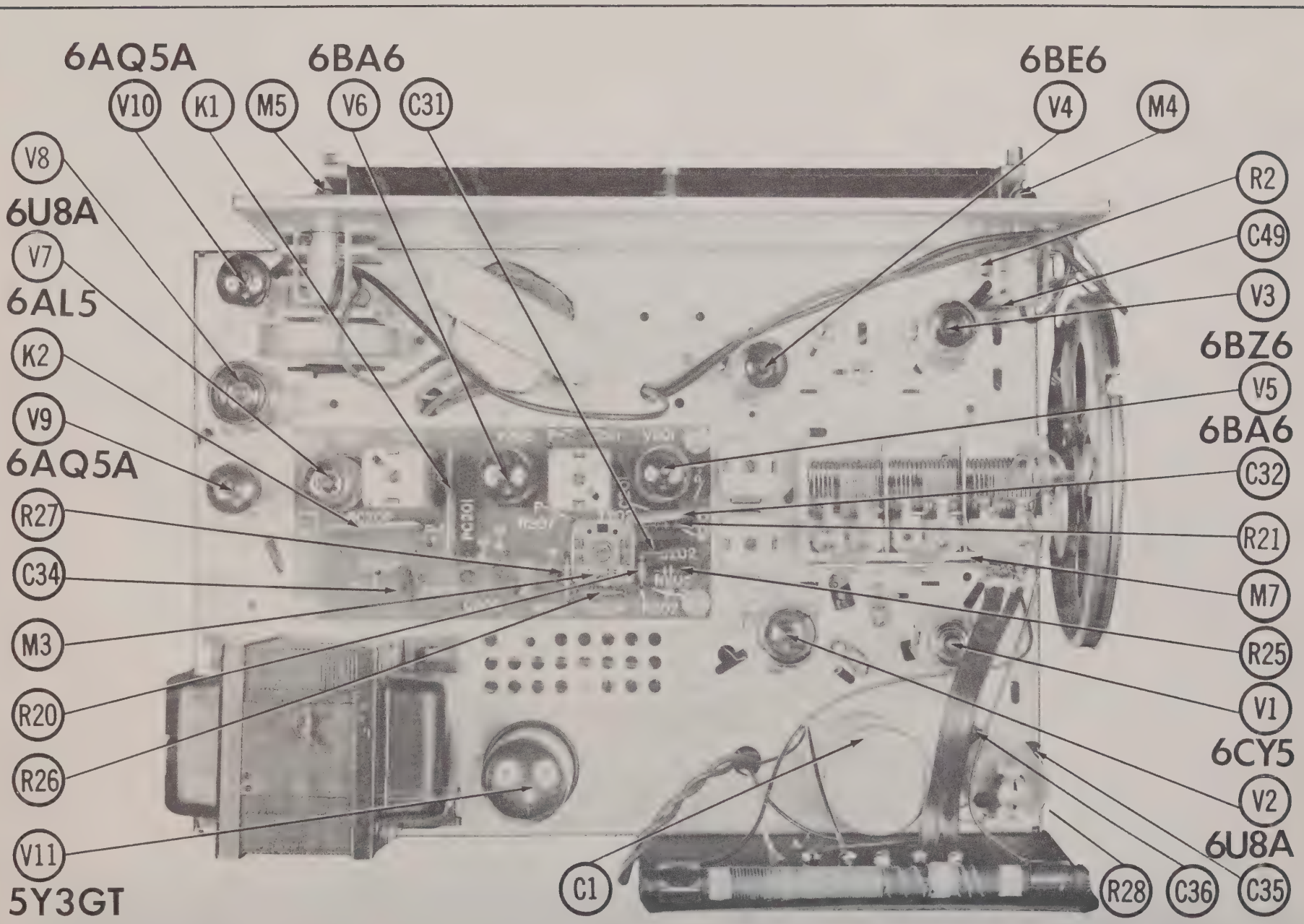
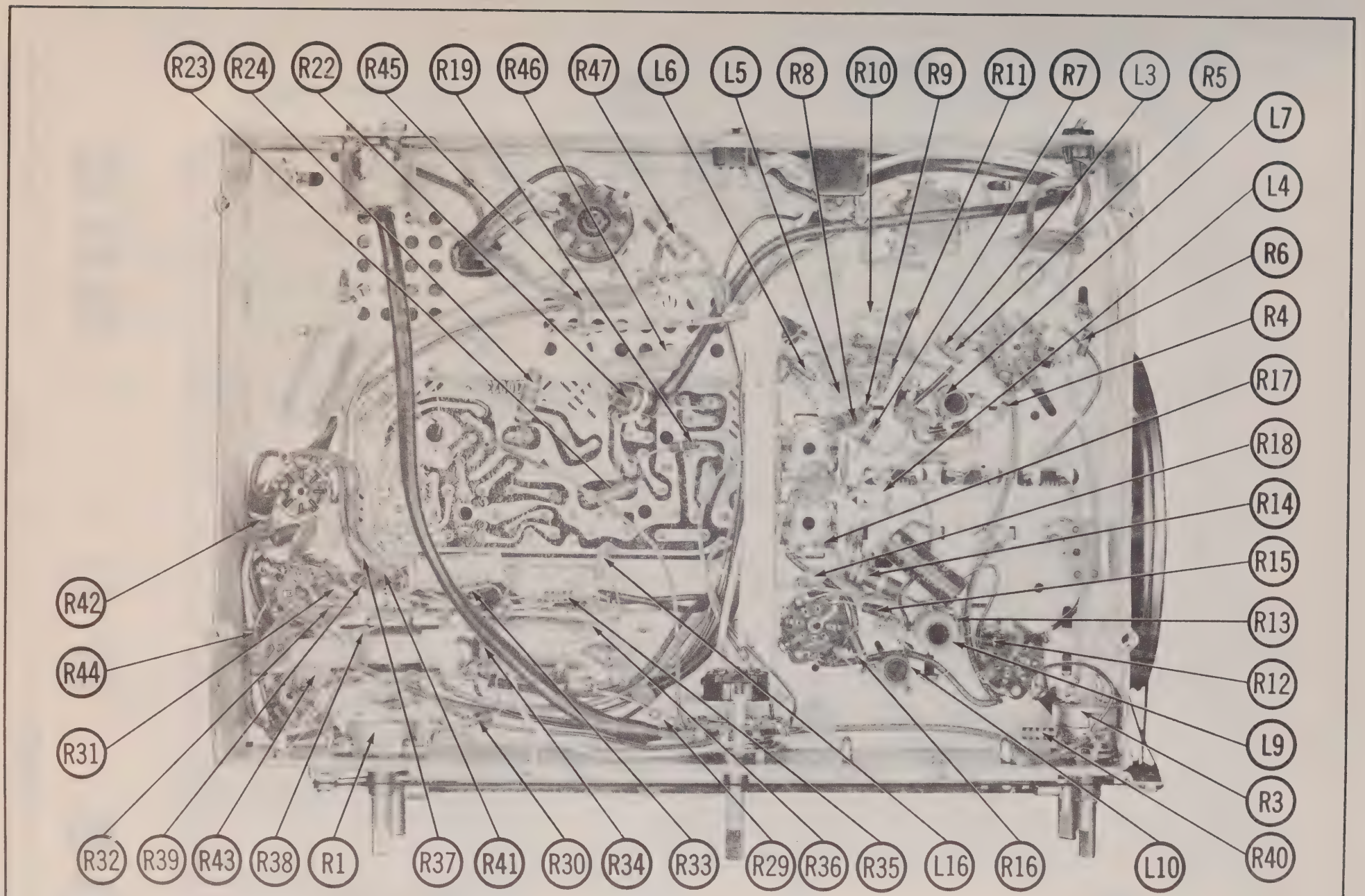
H993

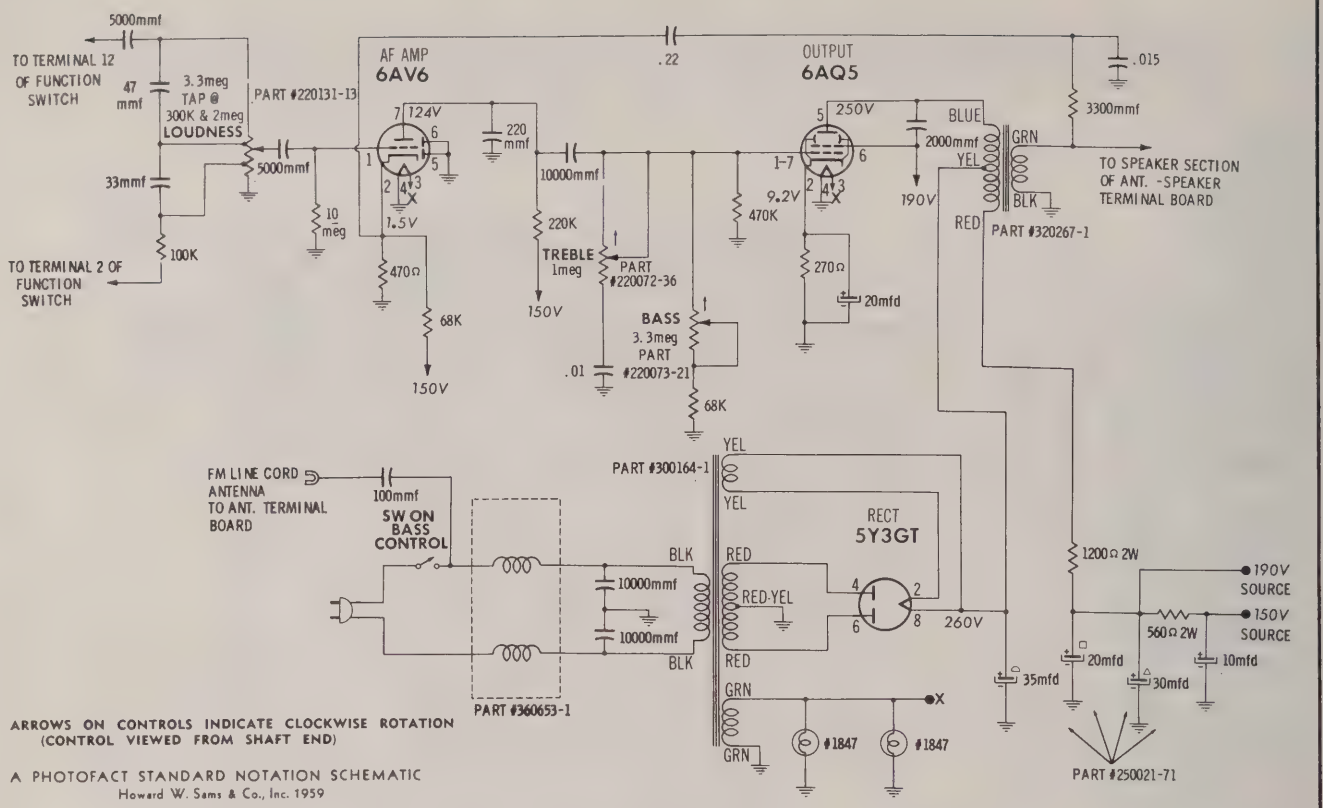
SET 441 FOLDER 9



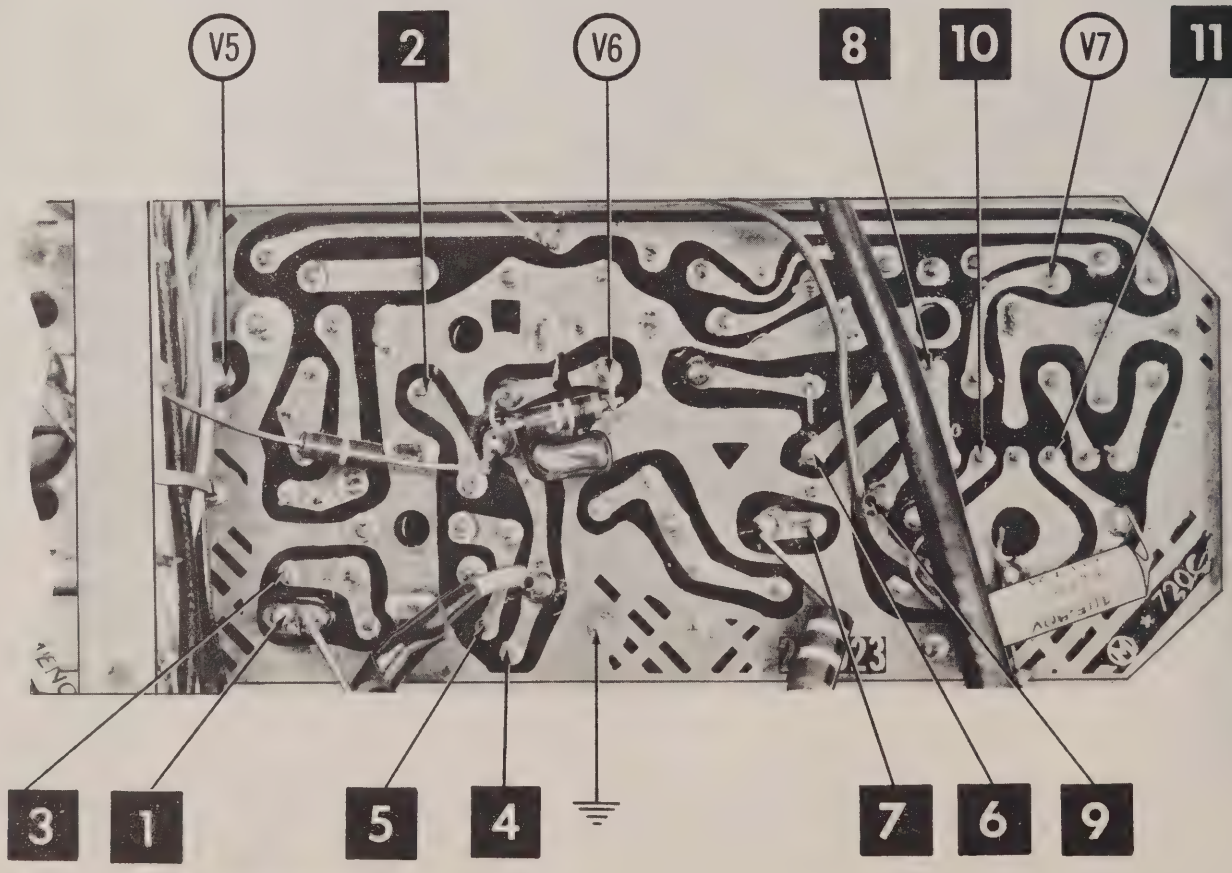
CHASSIS TOP VIEW - CAPACITOR, RESISTOR, MISC. & TUBE IDENT.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



POWER SUPPLY AND OUTPUT CIRCUITS USED IN CHASSIS 51-01



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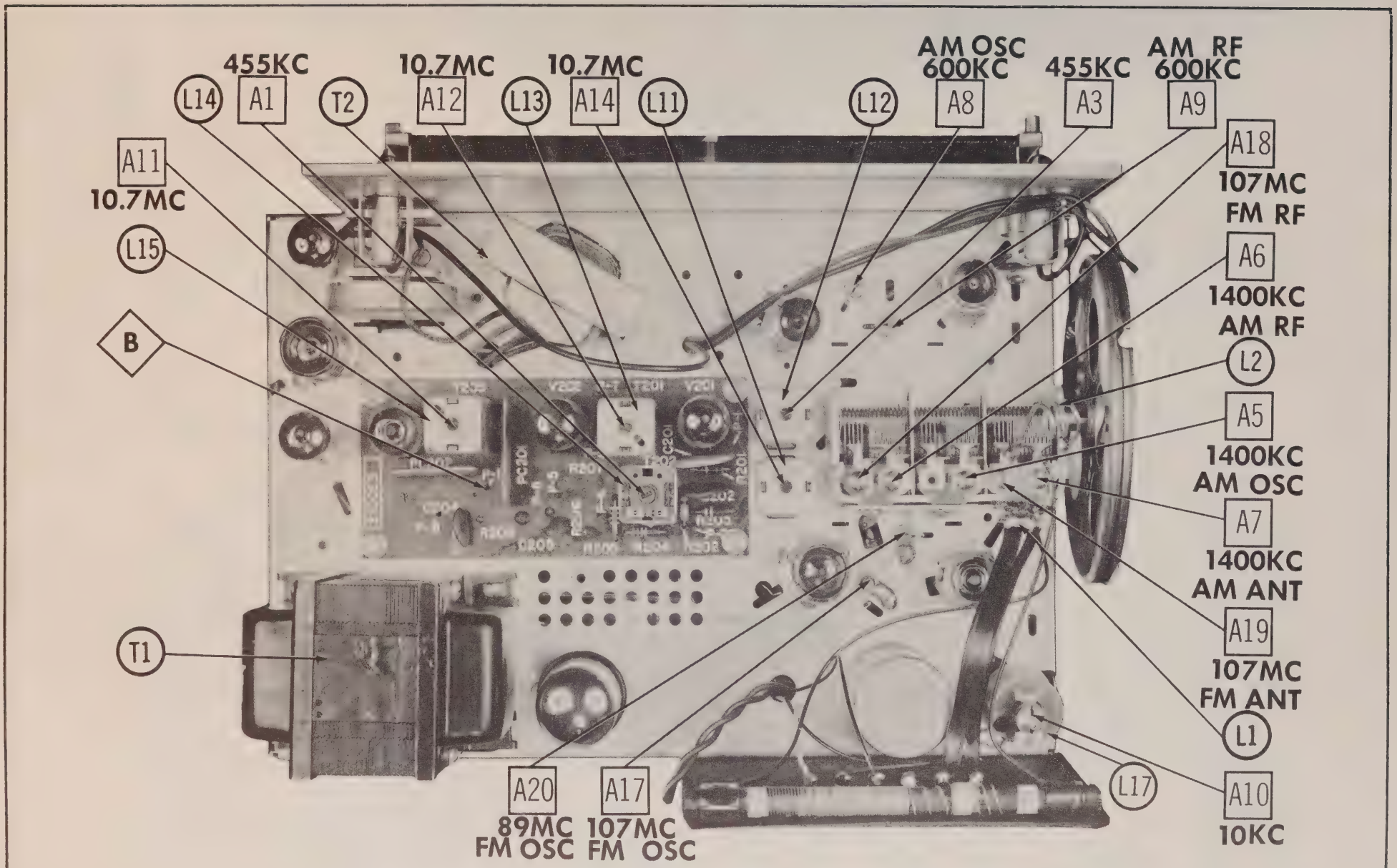
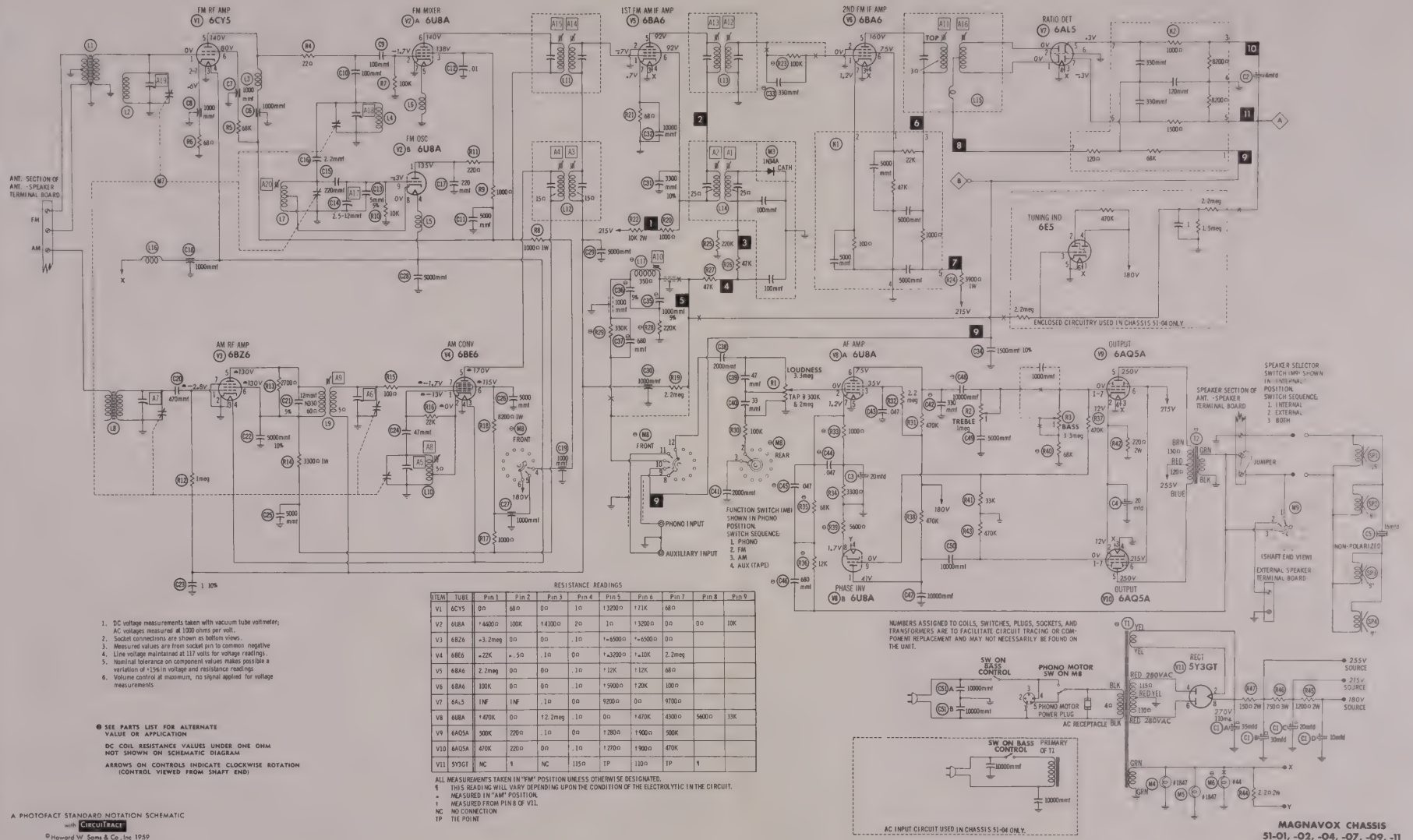
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS TOP VIEW - ALIGNMENT & INDUCTOR IDENT.


FM RF AMP V1 6CY5
FM MIXER V2A 6U8A
FM OSC V2B 6U8A
1ST FM-AM IF AMP V5 6BA6
2ND FM IF AMP V6 6BA6
RATIO DET V7 6AL5
TUNING IND 6E5
AM RF AMP V3 6BZ6
AM CONV V4 6BE6
AF AMP V8A 6U8A
PHASE INV V8B 6U8A
OUTPUT V9 6AQ5A
OUTPUT V10 6AQ5A
RECT V11 5Y3GT
ANT. SECTION OF ANT.-SPEAKER TERMINAL BOARD
FM
AM
ENCLOSED CIRCUITRY USED IN CHASSIS 51-04 ONLY
LOUDNESS 3.3meg
TAP @ 300K & 2meg
TREBLE 1meg
BASS 3.3meg
FRONT
REAR
PHONO INPUT
AUXILIARY INPUT
FUNCTION SWITCH (M8) SHOWN IN PHONO POSITION. SWITCH SEQUENCE: 1. PHONO 2. FM 3. AM 4. AUX (TAPE)
SPEAKER SECTION OF ANT.-SPEAKER TERMINAL BOARD
JUMPER
SPEAKER SELECTOR SWITCH (M9) SHOWN IN "INTERNAL" POSITION. SWITCH SEQUENCE: 1. INTERNAL 2 EXTERNAL 3 BOTH
(SHAFT END VIEW)
EXTERNAL SPEAKER TERMINAL BOARD
NON-POLARIZED
SW ON BASS CONTROL
PHONO MOTOR SW ON M8
5 PHONO MOTOR POWER PLUG
AC RECEPTACLE
SW ON BASS CONTROL
PRIMARY OF T1
AC INPUT CIRCUIT USED IN CHASSIS 51-04 ONLY.
255V SOURCE
215V SOURCE
180V SOURCE

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CY5	0Ω	68Ω	0Ω	1Ω	†3200Ω	†71K	68Ω		
V2	6U8A	†4400Ω	100K	†4100Ω	2Ω	1Ω	†3200Ω	0Ω	0Ω	10K
V3	6BZ6	≈3.2meg	0Ω	0Ω	1Ω	†≈6500Ω	†≈6500Ω	0Ω		
V4	6BE6	≈22K	≈.5Ω	1Ω	0Ω	†≈3200Ω	†≈10K	2.2meg		
V5	6BA6	2.2meg	0Ω	0Ω	1Ω	†12K	†12K	68Ω		
V6	6BA6	100K	0Ω	0Ω	1Ω	†5900Ω	†20K	100Ω		
V7	6AL5	INF	INF	1Ω	0Ω	9200Ω	0Ω	9700Ω		
V8	6U8A	†470K	0Ω	†2.2meg	1Ω	0Ω	†470K	4300Ω	5600Ω	33K
V9	6AQ5A	500K	220Ω	1Ω	0Ω	†280Ω	†900Ω	500K		
V10	6AQ5A	470K	220Ω	0Ω	1Ω	†270Ω	†900Ω	470K		
V11	5Y3GT	NC	¶	NC	115Ω	TP	110Ω	TP	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
≈ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 8 OF V11.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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MAGNAVOX CHASSIS 51-01, -02, -04, -07, -09, -11

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4, A12 thru A15.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7, A18, A19.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8, A9, A17.....GENERAL CEMENT #8721, 8722
WALSCO #2519
A10, A20.....GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519
A11, A16.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis.	455KC (400∿ Mod.)	AM	Point of non-interference	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	10mmf	High side thru 10mmf to AM antenna terminal. Low side to chassis.	1400KC	"	Tune to 1400KC signal	"	A5, A6 A7	"
3.	"	"	600KC	"	Tune to 600KC signal	"	A8, A9	Adjust for maximum output. Repeat steps 2 and 3.

10KC WHISTLE FILTER ADJUSTMENT

4.	.01mfd	High side to pin 1 (grid) of 6BA6 (V5). Low side to chassis.	10KC	AM	Point of non-interference	"	A10	Adjust for MINIMUM output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.01mfd	High side to pin 5 (grid) of 6CY5 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 1meg to point (A). Common to chassis.	A11, A12, A13, A14, A15	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.01mfd & 1000Ω in series	High side to pin 5 (grid) of 6CY5 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 1meg to point (A). Low side to chassis.	A11, A12, A13, A14, A15	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.	"	"	"	"	"	Vert. Amp. thru 1meg to point (B). Low side to chassis.	A16	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	120Ω, 150Ω Carbon Resistors	Across FM antenna term. (High side thru 120Ω, Low side thru 150Ω.)	107MC (Unmod.)	FM	107MC	Vert. Amp. thru 1meg to point (A). Low side to chassis.	A17, A18, A19	Adjust for maximum deflection.
8.	"	"	89MC	"	89MC	"	A20	Adjust for maximum deflection. Repeat steps 7 and 8.

FIG. 1

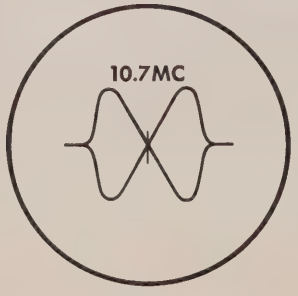
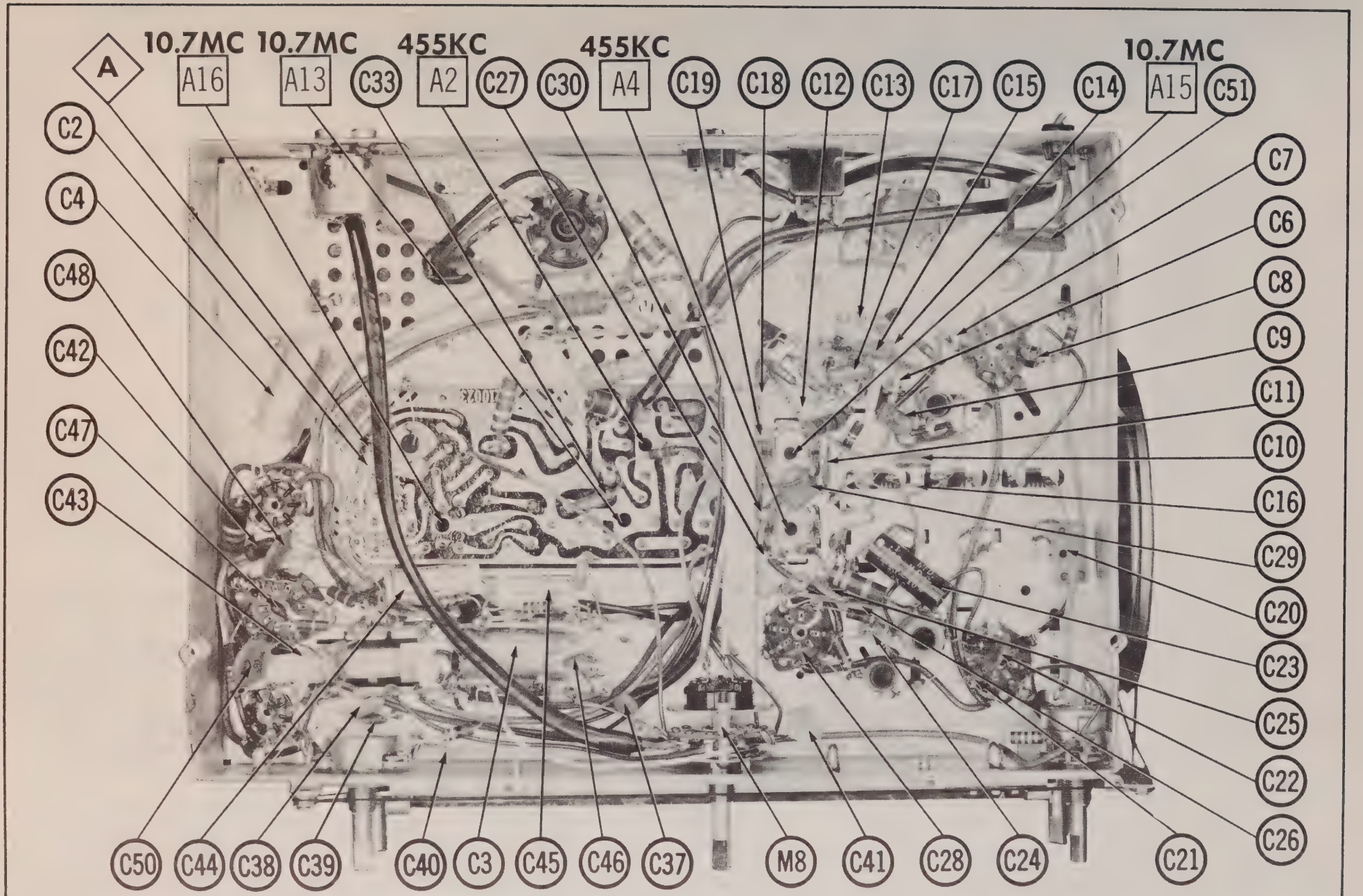


FIG. 2



CHASSIS BOTTOM VIEW - CAPACITOR, MISC. & ALIGN. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CY5	
V2	FM Mixer-FM Osc.	6U8A	
V3	AM RF Amplifier	6BZ6	
V4	AM Converter	6BE6	
V5	1st FM-AM IF Amplifier	6BA6	
V6	2nd FM IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V7	Ratio Detector	6AL5	
V8	AF Amp. - Phase Inv.	6U8A	
V9	Output	6AQ5	
V10	Output	6AQ5	
V11	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	▲35	350	270021-71	AFH4-15-20	C0330	FP444. 6	TMT-37	TVLS-4634.14*		
B	■30	350			BR1045		TD-10-450			
C	▲20	350								
D	10	350								
C2	4	50	270559-9	PRS150V4	BBR4-50	TT50X4	TD-4-50	TVA-1402		
C3	20	25	270027-28	PRS50V20	BBR20-25	TT25X20	TD-25-25	TVA-1205		
C4	20	25	270027-28	PRS50V20	BBR20-25	TT25X20	TD-25-25	TVA-1205		
C5	16	25NP	270040-4	NP-PRS30V20	BR3015 †	TCN2516	†TD-30-150	TVAS-1204.3*		
					BR3015 †		†TD-30-150			

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	1000			250276-1	EF-001	MFT-1000			503C-D1	
C7	1000			250276-2	EF-001	MFT-1000			503C-D1	
C8	1000			250276-2	EF-001	MFT-1000			503C-D1	
C9	100			250187-53	1469-0001	DD-101	5W5T1	MC235	MS-31	
C10	100			250187-53	1469-0001	DD-101	5W5T1	MC235	MS-31	
C11	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C12	. 01	400		250211-7	P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C13	5		5%	250088-138					5GA-V5S 5% *	
C14	2.5-12			250188-9						
C15	220			250187-57	1468-0022	DD-221	5W5T22		1FM-322	
C16	2. 2			250221-118	NPO-SI 2.2	TCZ-2R2	C10V22C	CNO-522	5TCCB-V22	
C17	220			250187-57	1469-0022	DD-221	5R5R22		MS-322	
C18	1000			250176-1	EF-001	MFT-1000			503C-D1	
C19	1000			250176-1	EF-001	MFT-1000			503C-D1	
C20	470			250159-102	1468-00047	DD-471	5W5T47		1FM-347	
C21	12		N330 5%	250088-179						
C22	5000		10%	250175-30	BPD-005	DD-502	BYA10D5	JL-250	5HK-D5S 10% *	
C23	. 1	100	10%	250261-125					2WF-P1	
C24	47			250218-17	BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C25	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C26	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C27	1000			250276-1	EF-001	MFT-1000			503C-D1	
C28	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C29	5000			250175-30	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C30	1000			250276-1	EF-001	MFT-1000			503C-D1	
C31	3300		10%	250234-154	DI-3300		L10D33	JL-233	5HK-D33S 10% *	
C32	10000			250234-66	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C33	330			250202-11	SI 330	D6-331	LT6T33	UC-5333	5GA-T33	①
C34	1500		10%	250234-146	DI-1500			JL-215	5HK-D15S 10% *	
C35	1000		5%	250228-354	1469-001		1R5D1	MCE-475	MS-21	①
C36	1000		5%	250228-354	1469-001		1R5D1	MCE-475	MS-21	①
C37	680			250218-4	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	①
C38	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C39	47			250218-17	BPD-000047	DD-470	L10Q47	CNO-447	5GA-Q47	
C40	33			250218-21	BPD-000033	DD-330	L10Q33	CNO-433	5GA-Q33	
C41	2000			250218-20	BPD-002	DD-202	BYA10D2	B-220	5GA-D2	
C42	330			250207-49	BPD-0003	D6-331	LT6T33	UC-5322	5GA-T33	②
C43	. 047	200		250202-11	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C44	. 047	200		250202-11	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	③
C45	. 047	200		250202-11	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	③

CAPACITORS (cont)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C46	680			250218-4	BPD-00068	DD-681	BYA10T68	B-368	5GA-T68	④
C47	10000			250218-22	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C48	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	⑤
C49	5000			250202-11	BPD-005	DF-502	BYA10D5	B-250	5HK-D5	
C50	10000			250218-19	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C51A	10000			250219-3	BPD-01	DD3-103	BYA10S1	B-110	5HK-S1	
B	10000				BPD-01		BYA10S1	B-110	5HK-S1	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Not used in some versions.
② Chassis 51-01BA use 100mmf in this application.
③ Chassis 51-01BA use .1mfd in this application.
④ Chassis 51-01BA use 470mmf in this application.
⑤ Chassis 51-01BA use 3300mmf in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	3. 3meg	½	220131-3				UDT303	Loudness, Tap ⑨ 300K & 2meg
B	Shaft						Not Req.	
R2A	1meg	½	220072-36	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	3. 3meg	½	220073-21	B-85	A47-3meg-Z	Q13-140	U57	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power On-Off

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R4	22Ω		230104-42	
R5	68K		230104-84	
R6	68Ω		230104-48	
R7	100K		230104-86	
R8	1000Ω	1	230105-62	
R9	1000Ω		230104-62	
R10	10K		230104-74	
R11	220Ω		230104-54	
R12	1meg		230104-98	
R13	2700Ω		230104-67	
R14	3300Ω	1	230105-68	
R15	100Ω		230104-50	
R16	22K		230104-78	
R17	1000Ω		230104-62	
R18	8200Ω	1	230105-73	
R19	2. 2meg		230104-102	
R20	1000Ω		230104-62	
R21	68Ω		230104-48	
R22	10K	2	230106-1074	
R23	100K		230104-86	Note 1
R24	3900Ω	1	230105-69	
R25	220K		230104-90	

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R26	47K		230104-82	
R27	47K		230104-82	
R28	220K		230104-90	Note 2
R29	330K		230104-92	Note 2
R30	100K		230104-86	
R31	470K		230104-94	
R32	2. 2meg		230104-102	
R33	1000Ω		230104-62	Note 3
R34	3300Ω		230104-68	
R35	68K		230104-84	Note 4
R36	12K		230104-75	Note 5
R37	470K		230104-94	
R38	470K		230104-94	
R39	5600Ω		230104-71	Note 6
R40	68K		230104-84	Note 7
R41	33K		230104-80	
R42	220Ω	2	230106-1054	
R43	470K		230104-94	
R44	2. 2Ω	2	230109-2	
R45	1200Ω	2	230106-1063	
R46	750Ω	3	230150-315	
R47	150Ω	2		

Note 1. Not used in some versions.
Note 2. Not used in Chassis 51-02.
Note 3. Chassis 51-01BA use a 330Ω in this application.
Note 4. Chassis 51-04 use a 22K in this application.
5. Chassis 51-01BA use a 4700Ω in this application.
6. Chassis 51-01BA use a 3300Ω in this application.
7. Chassis 51-01BA use a 150K in this application.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	2nd FM IF B+, Cathode Net.	5000mmf, 5000mmf, 5000mmf, 5000mmf, 100Ω, 1000Ω, 22K, 47K	250255-1	Sprague FS-7
K2	Ratio Det. Net.	120mmf, 330mmf, 330mmf, 120Ω, 1000Ω, 1500Ω, 8200Ω, 68K	250254-1	Sprague C-9

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		MAGNAVOX PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	360491-4					
L2	FM Ant. Coil	360750-1					
L3	RF Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L4	FM RF Coil	360751-1					
L5	Fil. Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L6	Fil. Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L7	FM Osc. Coil	360628-1					
L8	Loopstick	360746-1					
L9	AM RF Trans.	360753-1					
L10	AM Osc. Coil	360752-1	14-1055	70-OSC.*			* Disregard Primary
L11	1st FM IF Trans.	360626-1	16-3487	FM-254	1463		
L12	1st AM IF Trans.	360611-1	16-6758	BC-352	12-C1	RF-1	
L13	2nd FM IF Trans.	360747-1	16-3490		1463-PC		
L14	2nd AM IF Trans.	360749-1					
L15	Ratio Detector	360748-1			1465-PC		
L16	Fil. Choke	460522-9	19-1002	BC-563	4606		2 Microhenries
L17	10KC Filter	360621-1					Note 1

Note 1. Not used in Chassis 51-02.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .81A	560VCT @ .110A	5V @ 2A	300165-1 ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 3.8A									

① Chassis 51-02 uses Part #300164-1; Chassis 51-04 uses Part #300165-2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω CT	2-3Ω	320077-1	A1011	A-2935	AU-609	A-3870	22S58	S-55X	
	10.8K Tap @ 5%	3-4Ω	320267-1 ①							① Used in Chassis 51-02 only

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	15"	PM	4.3Ω	583903	15A10Z4	
SP2	8"	PM	5.6Ω	583865	8A4Z5.6	
SP3	5"	PM	3.4Ω	580038-1	5A07	
SP4	5"	PM	3.4Ω	580038-1	5A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	MAGNAVOX PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		89-TB				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MAGNAVOX PART No.	JENSEN PART No.	WALCO PART No.	
M2		† S-66 or †♦ S-66SD or ♦ S-66D		† Jewel ♦ Diamond

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N34A	530049-1	1N34A	1N38A	AM Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Lamp	180161-17	#1847
M5	Lamp	180161-17	#1847
M6	Lamp		#44, Not used in Chassis 51-02, 51-04
M7	Tuning Cap.	260147-1	6 Gang (AM Sections: Ant. 28-322mmf, RF 15-280mmf, Osc. 22-151mmf)
M8	Switch	160284-1	Function, Selector, 4 Position (Rotary Wafer Type) Includes SPDT Snap Type Switch
	Switch	160284-2	Function Selector (Rotary Wafer Type) Ch. 51-02, 51-04
M9	Switch		Speaker, Internal-External (Rotary Wafer Type)
	Printed Board	210023	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	102448-2	
Dial Glass	150520-1	Chassis 51-01
Dial Glass	150521-1	Chassis 51-02, 51-04
Dial Glass	150549-1	Chassis 51-07

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

OLYMPIC-OPTA MODEL 5920

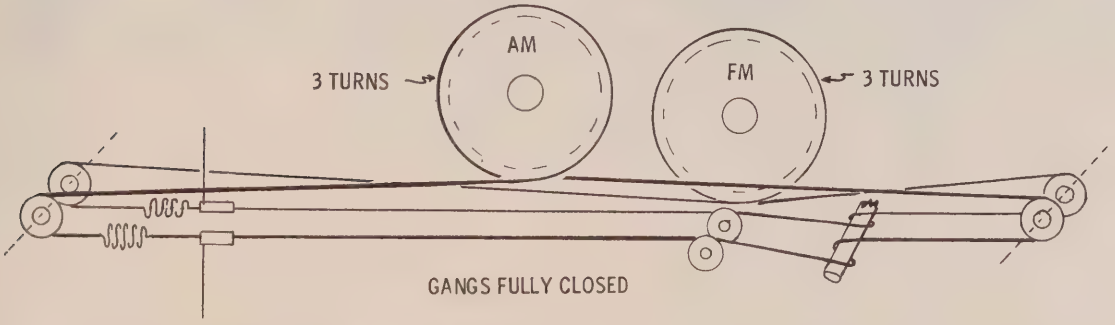
OLYMPIC-OPTA MODEL 5920

OLYMPIC-OPTA MODEL 5920

TRADE NAME	Olympic-Opta Model 5920		
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated FM-BC-SW-LW Receiver With 4 Speed Automatic Record Changer		
TUBES (Eight)	Types ECC85/6AQ8 FM RF Amp.-FM Conv., ECH81/6AJ8 1st FM IF Amp.-AM Mixer-AM Osc., EF89 2nd FM-1st AM IF Amp., EABC80/6T8 Ratio Det.-AM Det.-AVC-AF Amp., EM80/6BR5 Tuning Indicator, EC92/6AB4 Phase Inv., (2) EL84/6BQ5 Output		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.62 Amp. @ 117 Volts AC (65 Watts) FM
TUNING RANGES	BROADCAST 525-1620KC LONG WAVE 150-375KC	FREQ. MOD. 88-108MC SHORT WAVE 6-19MC	

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE PERPETUUM-EBNER REX AA-PHOTOFACT SET 378 FOLDER 10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H685

SET 441 FOLDER 10

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†40K	500K	0Ω	0Ω	.1Ω	†2000Ω	0Ω	170Ω	0Ω
V2	ECH81	†40K	1meg ▰3meg	0Ω	.1Ω	0Ω	†3000Ω	0Ω ▰30K	INF ▰†30K	0Ω ▰30K
V3	EF89	0Ω	1meg ▰3meg	170Ω	.1Ω	0Ω	0Ω	†3000Ω	†50K	30K
V4	EABC80	INF	30K	INF	.1Ω	0Ω	350K	0Ω	10meg	†300K
V5	EM80	2meg	0Ω	†1000Ω	0Ω	.1Ω	NC	†500K	NC	†1000Ω
V6	EC92	†300K	NC	.1Ω	0Ω	NC	10meg	0Ω		
V7	EL84	900K	900K	250Ω	.1Ω	0Ω	NC	†180Ω	NC	†1000Ω
V8	EL84	900K	900K	250Ω	.1Ω	0Ω	NC	†170Ω	NC	†1000Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

† MEASURED FROM OUTPUT OF M1.

▰ MEASURED IN "AM" POSITION.

NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	455KC (400∿ Mod.)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to AM antenna terminal. Low side to chassis.	"	"	"	"	A5	Adjust for MINIMUM output.
3.	"	"	1600KC	"	1600KC	"	A6	Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A7	"
5.	"	"	1500KC	"	Tune to 1500KC signal	"	A8	"
6.	"	"	600KC	"	Tune to 600KC signal	"	A9	"
7.	"	"	200KC	LW	200KC	"	A10, A11	"
8.	"	"	7.2MC	SW	7.2MC	"	A12, A13	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	200mmf	High side to pin 2 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A14, A15, A16, A17, A18	Adjust for maximum deflection.
10.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	200mmf	High side to pin 2 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A14, A15, A16, A17, A18	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
10.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A19	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	Across FM antenna receptacle with 270Ω in high side.	98MC (Unmod.)	FM	98MC	DC probe to point (A). Common to chassis.	A20, A21	Adjust for maximum deflection.

FIG. 1

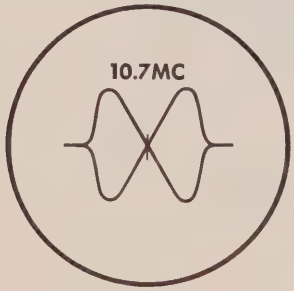
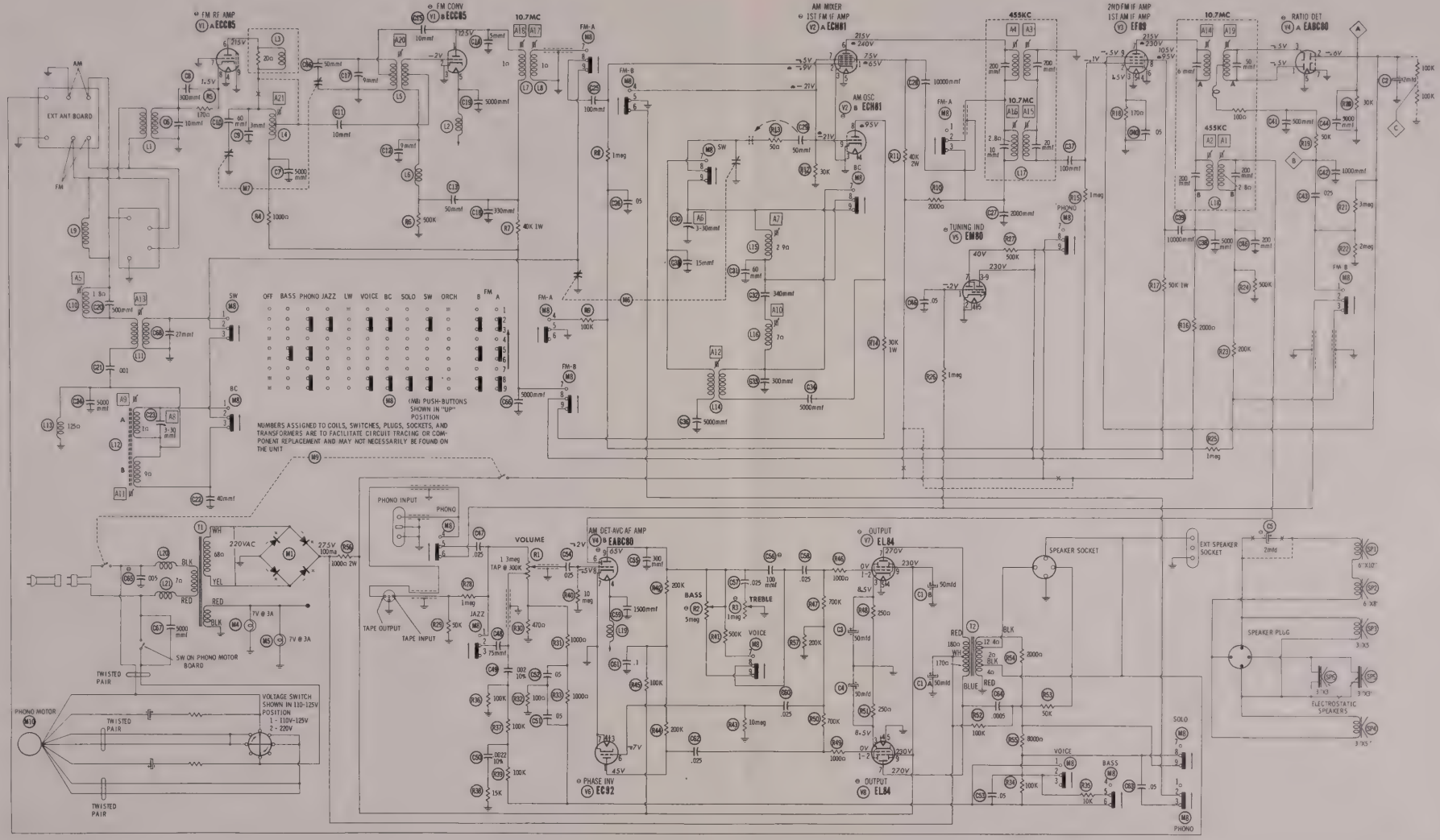


FIG. 2



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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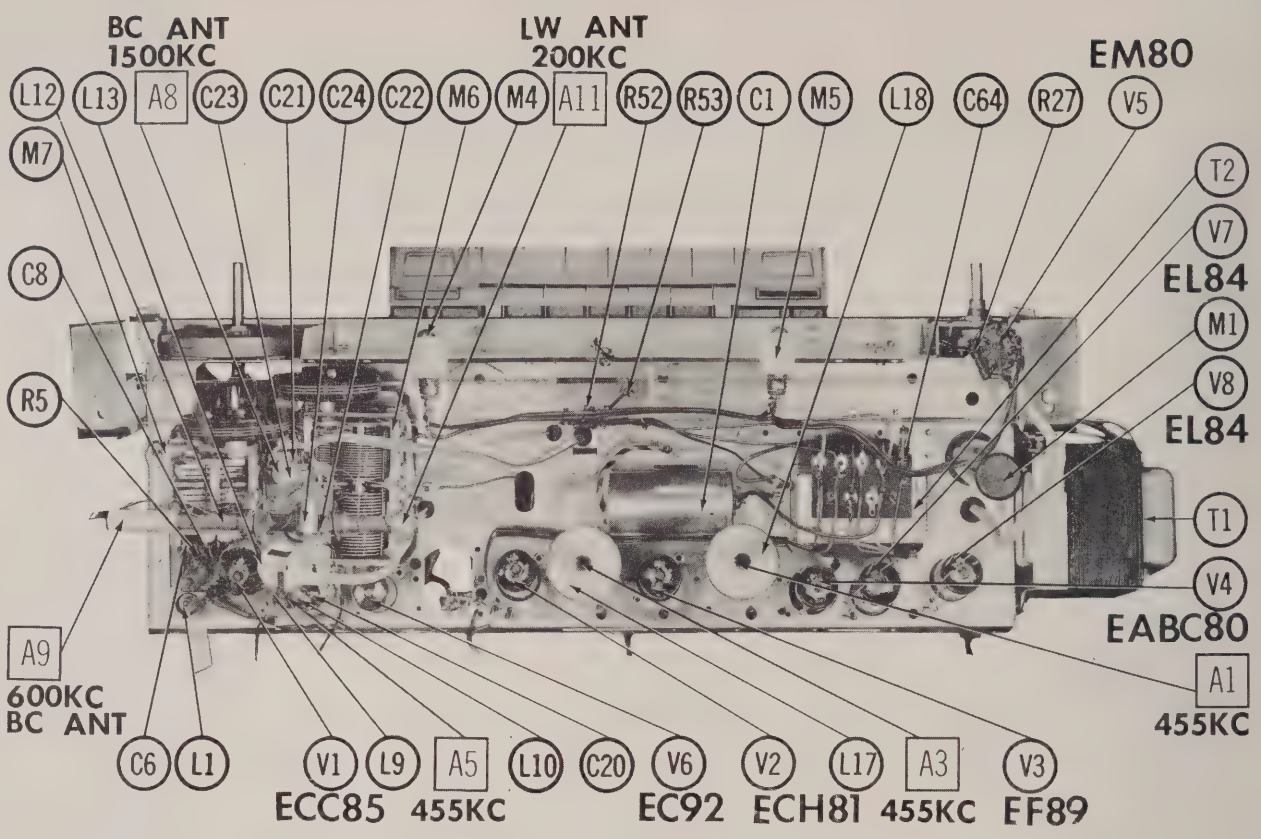
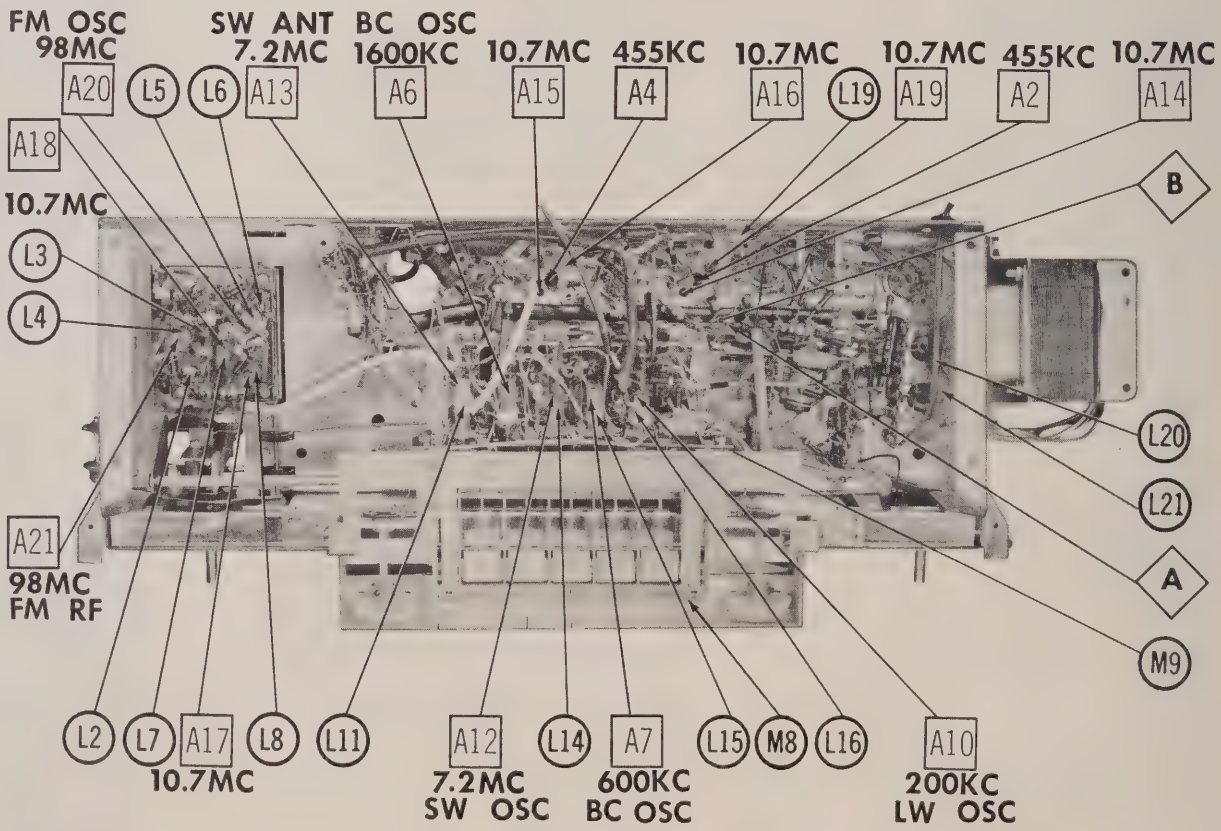
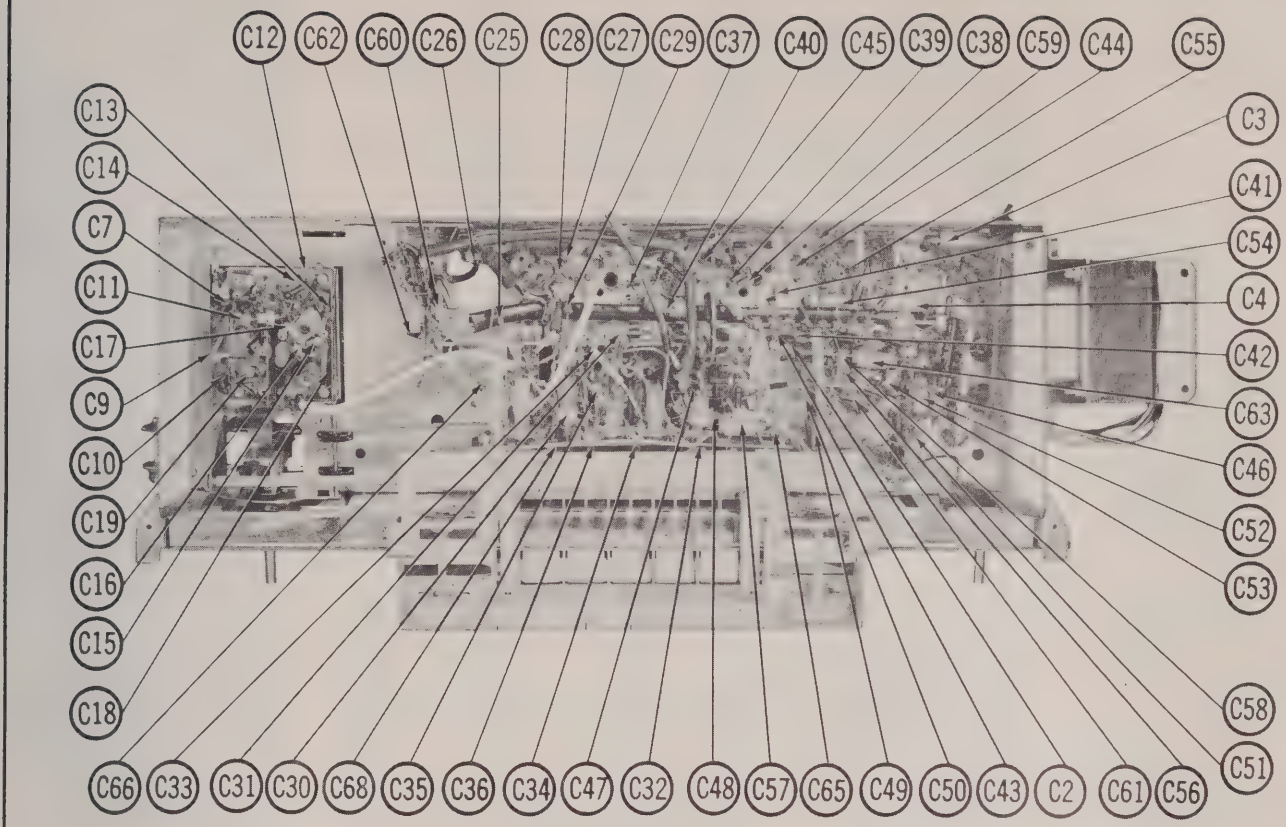
OLYMPIC-OPTA
MODEL 5920



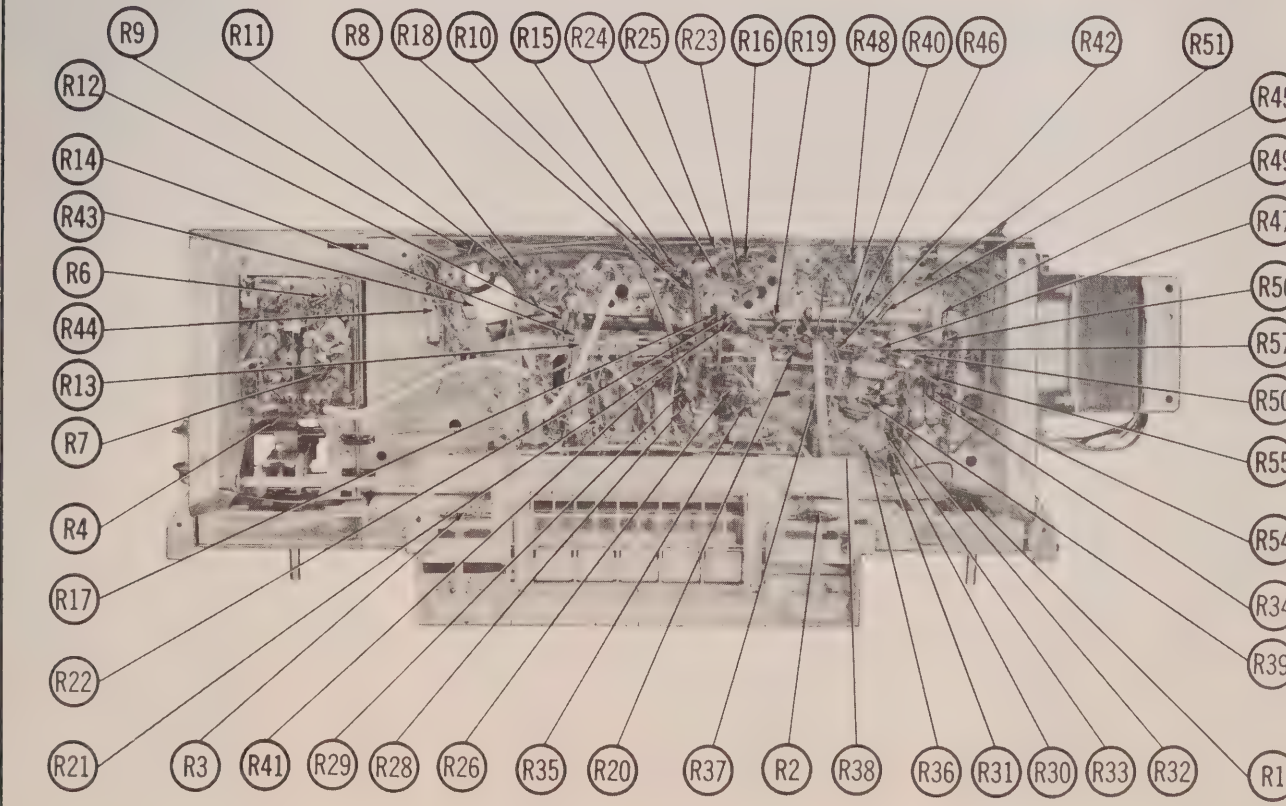
CHASSIS - TOP VIEW



CHASSIS BOTTOM VIEW - ALIGN, INDUCTOR, & MISC IDENT



CHASSIS BOTTOM VIEW - CAPACITOR IDENT



CHASSIS BOTTOM VIEW - RESISTOR IDENT

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Olympic-Opta PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C63	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C64	.0005	500		P688N-0005	D6-501	CUB6T5		6TM-T5	
C65	.005	500		P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	②
C66	5000			SI 5000	D6-502	LT6D5	DC525	5HK-D5	
C67	5000			SI 5000	D6-502	LT6D5	DC525	5HK-D5	
C68	27			SI 27	D6-270	L10Q27	UC-5427	5GA-Q27	

① Some versions may use 300mmf in this application.
② Some versions may use .5mfd in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Olympic-Opta PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1.3meg	½	PTG25174					Volume, Tap ② 300K
R2	5meg	½	PTG25115					Bass ①
R3	1meg	½	PTG25114					Treble ②

① Bass control assembly Part #PTG25026. ② Treble control assembly Part #PTG25025.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Olympic-Opta PART No.	NOTES
R4	1000Ω			
R5	170Ω			
R6	500K			
R7	40K	1		
R8	1meg			
R9	100K			
R10	2000Ω			
R11	40K	2		
R12	30K			
R13	50Ω			
R14	30K	1		
R15	1meg			
R16	2000Ω			
R17	50K	1		
R18	170Ω			
R19	50K			
R20	30K			
R21	3meg			
R22	2meg			
R23	200K			
R24	500K			
R25	1meg			
R26	1meg			
R27	500K			
R28	1meg			
R29	50K			
R30	470Ω			
R31	1000Ω			

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Olympic-Opta PART No.	NOTES
R32	100Ω			
R33	1000Ω			
R34	100K			
R35	10K			
R36	100K			
R37	100K			
R38	15K			
R39	100K			
R40	10meg			
R41	500K			
R42	200K			
R43	10meg			
R44	200K			
R45	100K			
R46	1000Ω			
R47	700K			
R48	250Ω			
R49	1000Ω			
R50	700K			
R51	250Ω			
R52	100K			
R53	50K			
R54	2000Ω			
R55	8000Ω			
R56	1000Ω	2		
R57	200K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Olympic-Opta PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Antenna Trans.						
L2	Fil. Choke		19-1000 ▲	BC-562 ▲	4604 ▲		1.5 Microhenry; Wound on 20K
L3	RF Choke						
L4	FM RF Coil						
L5	FM Osc. Coil						
L6	RF Choke		19-1000	BC-562	4604		1.5 Microhenry
L7	1st FM IF Pri.						
L8	1st FM IF Sec.						
L9	RF Choke		19-1000	BC-562	4604		1.5 Microhenry
L10	IF Trap						
L11	SW Ant. Trans.						
L12A	BC Ant. Coil	LPG25197					
B	LW Ant. Coil						
L13	Ant. Coil						
L14	SW Osc. Coil						
L15	BC Osc. Coil						
L16	LW Osc. Coil						
L17A	2nd FM IF	TRG25180					
B	1st AM IF						
L18A	Ratio Det.	TRG25181					
B	2nd AM IF						
L19	Fil. Choke		19-1000	BC-562	4604		1.5 Microhenry
L20	Line Choke	CKG25198					
L21	Line Choke	CKG25198					

▲ Parallel with 20K resistor.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Olympic-Opta PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .6A	220V @ .100A	6.3V @ 3.8A	TRG25164						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Olympic-Opta PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4700Ω CT	35Ω Taps @ 5Ω, 4Ω	TRG25165							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Olympic-Opta PART No.	QUAM PART No.	
SP1	6" x 10"	PM	4-6Ω	SKG25166		
SP2	6" x 8"	PM	4-6Ω	SKG25167		
SP3	3" x 5"	PM	3-4Ω	SKG25195		
SP4	3" x 5"	PM	3-4Ω	SKG25195		
SP5	3" x 3"	Electrostatic		SKG25170		
SP6	3" x 3"	Electrostatic		SKG25170		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Olympic-Opta PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.1A	RFG25034		60-9150 ①	D-64 ②	① Two used. ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Olympic-Opta PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Olympic-Opta PART No.	JENSEN PART No.	WALCO PART No.	
M3			† W-93TPS or †♦ W-93DS or † W-93TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Olympic-Opta PART No.	NOTES
M4	Lamp		7V @ .3A
M5	Lamp		7V @ .3A
M6	Tuning Cap.	CVG25177	2 Gang AM (Ant. 12-545mmf, Osc. 15-552mmf)
M7	Tuning Cap.	CVG25168	2 Gang FM
M8	Switch	PBG25194	Pushbutton Slide, Keyboard Complete
M9	Switch	SWG25187	Rotary Snap, Pushbutton Operated On-Off
M10	Motor		Phono Motor

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KNG25172	Volume and Tuning
Knob	KNG25173	Treble and Bass
Cabinet	CAG25182	
Pointer	POG25178	FM, Short
Pointer	POG25179	AM, Long
Dial Glass	DLG25162	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp.-FM Conv.	ECC85/6AQ8 ①
V2	1st FM IF Amp. - AM Mixer-AM Osc.	ECH81/6AJ8 ①
V3	2nd FM-1st AM IF Amp.	EF89
V4	Ratio Det.-AM Det.- AVC-AF Amp.	EABC80/6T8 ①
V5	Tuning Indicator	EM80/6BR5 ①
V6	Phase Inverter	EC92/6AB4 ①
V7	Output	EL84/6BQ5 ①
V8	Output	EL84/6BQ5 ①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Olympic-Opta PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385	COG25171	PRS450V4040	XB0455	WQ795	TDLD-32 TD-20-450	D-190	R2462 *
B	50	385							
C2	2	80		PRS450V2	BR245	TT150X2	TD-2-450	MT-4502	TVA-1701
C3	50	15		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C4	50	15		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C5	2	80	①	PRS450V2	BR245	TT150X2	TD-2-450	MT-4502	TVA-1701

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Olympic-Opta PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C7	5000			SI 5000	D6-502	LT6D5	UC-525	5HK-D5	
C8	300			DI 300	DD-301	L10T3	UC-535	5GA-T3	
C9	3			NPO-DI 3	D6-030	C10V3C	ZT-553		
C10	60								
C11	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C12	9								
C13	50			SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C14	5			DI 5	DD-050	L10V5	ZT-555	5GA-V5	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Olympic-Opta PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C15	10			SI 10	D6-100	LT6Q1	UC-541	5GA-Q1	
C16	50			SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C17	9								
C18	330			SI 330	D6-331	LT6T33	UC-5333	5GA-T33	
C19	5000			SI 5000	D6-502	LT6D5	UC-525	5HK-D5	
C20	500			1468-0005	DD-501	5W5T5	MC245	5GA-T5	
C21	.001	500		P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	
C22	40			SI 39	D6-400	LT6Q39	UC-5439	5GA-Q39	
C23	3-30								
C24	5000			1467-005	DD-502	1W5D5	MC465	1FM-25	
C25	100			SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C26	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C27	2000			1467-002	DD-202	1W5D2	MC457	1FM-22	
C28	10000			SI 10000	D6-103	LT6S1	DC511	5HK-S1	
C29	50			SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C30	3-30								
C31	60								
C32	340								
C33	300			SI 300	D6-301	LT6T3	UC-533	5GA-T3	
C34	5000			SI 5000	D6-502	LT6D5	UC-525	5HK-D5	
C35	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C36	5000			SI 5000	D6-502	LT6D5	UC-525	5HK-D5	
C37	100			SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C38	5000			SI 5000	D6-502	LT6D5	UC-525	5HK-D5	
C39	10000			SI 10000	D6-103	LT6S1	DC-511	5HK-S1	
C40	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C41	500			BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C42	1000			BPD-001	DD-102	L10D1	DC521	5HK-D1	
C43	.025	250		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C44	5000			SI 5000	D6-502	LT6D5	UC-525	5HK-D5	
C45	200			1468-0002	DD-201	5W5T2	MC237	1FM-32	
C46	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C47	.025	250		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C48	75			SI 75	D6-750	LT6Q75	UC-5475	5GA-Q75	
C49	.002	125					GEM-1622		10%
C50	.0022	125							10%
C51	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C52	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C53	.05	250		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C54	.025	250		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C55	300			DI 300	DD-301	L10T3	UC-533	5GA-T3	
C56	100			SI 100	D6-101	L10T1	UC-531	5GA-T1	①
C57	.025	500		P688N-025		CUB6S22	GEM-6125	6TM-S25	
C58	.025	500		P688N-025		CUB6S22	GEM-6125	6TM-S25	
C59	1500			SI 1500	D6-152	LT6D15	DC515	5HK-D15	
C60	.025	250		P488N-025		CUB6S22	GEM-4125	4TM-S25	
C61	.1	500		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C62	.025	500		P688N-025		CUB6S22	GEM-6125	6TM-S22	

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PENTRON MODEL CA-15

PENTRON
MODEL CA-15

PENTRON
MODEL CA-15

TRADE NAME	Pentron Model CA-15
MANUFACTURER	Pentron Corp., 777 S. Tripp Ave., Chicago 24, Illinois
TYPE SET	AC Operated 5 Tube Stereo Preamplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 22 Watts, .24 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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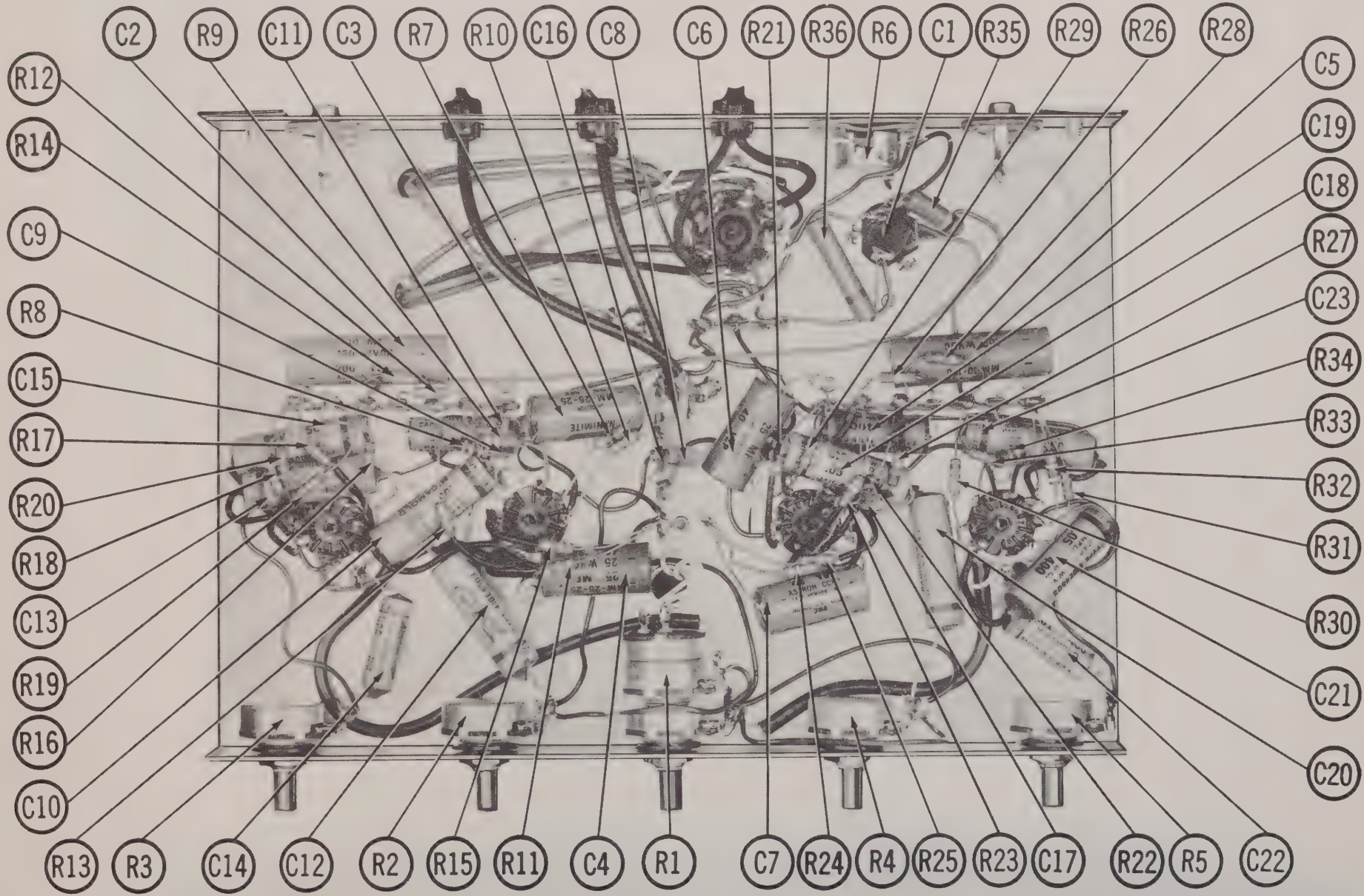


CHASSIS TOP VIEW - TRANSISTOR, CAPACITOR, MISC. & ALIGN. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Left Channel-AF Amp.	12AY7	
V2	Left Channel-AF Amp.	12AU7	
V3	Right Channel-AF Amp.	12AY7	

ITEM No.	USE	TYPE	NOTES
V4	Right Channel-AF Amp.	12AU7	
V5	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	■30	350		AFH3-28-30	C0225	FP330.7	TMD-36 TD-10-450	TVL-3639.8		
B	▲20	350								
C	10	350								
C2	10	150		PRS150V10	BBR10-150	TC42	TD-10-150	TVA-1406		
C3	25	25		PRS25V25	BBR25-25	TC36	TD-25-25	TVA-1205		
C4	25	25		PRS25V25	BBR25-25	TC36	TD-25-25	TVA-1205		
C5	10	150		PRS150V10	BBR10-150	TC42	TD-10-150	TVA-1406		
C6	25	25		PRS25V25	BBR25-25	TC36	TD-25-25	TVA-1205		
C7	25	25		PRS25V25	BBR25-25	TC36	TD-25-25	TVA-1205		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	250		10%		DI-250	D6-251	L10T25		5GA-T25S 10%*	
C9	250		10%		DI-250	D6-251	L10T25		5GA-T25S 10%*	
C10	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C11	.02	400			P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C12	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C13	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C14	.01	400			P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C15	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C16	250		10%		DI-250	D6-251	L10T25		5GA-T25S 10%*	
C17	250		10%		DI-250	D6-251	L10T25		5GA-T25S 10%*	
C18	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C19	.02	400			P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C20	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C21	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C22	.01	400			P488N-01	DD-103	CUB4S1	GEM-411	4TM-S1	
C23	.05	400			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

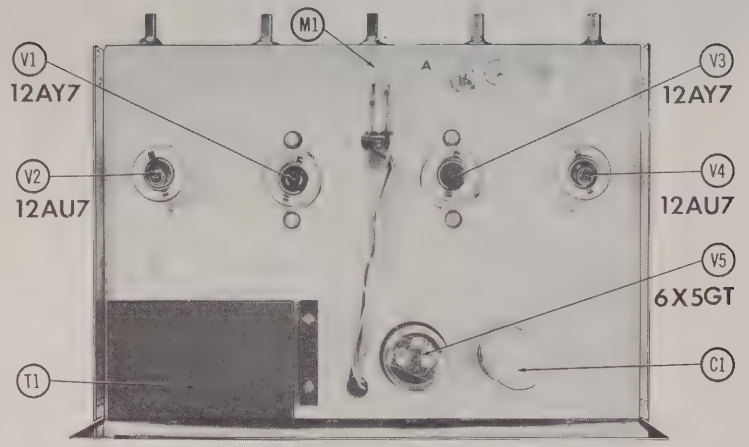
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PENTRON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	126-A-10513		AD47-500K-Z	Q13-133		Master Gain, Left Channel
B	500K	½			Not Req.	M13-133	†UE3916-S	Master Gain, Right Channel
C	Shaft				FS-3	Not Req.		
D	Switch				SWE-12	76-1		
R2A	500K	½	126A50413-7	B-60	A47-500K-Z	Q13-133	U48	Right Gain
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	½	126A50413-7	B-60	A47-500K-Z	Q13-133	U48	Right Equalization
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	500K	½	126A50413-7	B-60	A47-500K-Z	Q13-133	U48	Left Gain
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	½	124A50413-7	B-60	A47-500K-Z	Q13-133	U48	Left Equalization
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6	126Ω	2(WW)						Hum Adjust

† "STA-LOC" equivalent: FB55A, RU55A, CS-3500, US-41

CHASSIS—TOP VIEW



RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R7	1meg			
R8	33K			
R9	220K			
R10	3300Ω			
R11	470K			
R12	12K			
R13	68K			
R14	68K			
R15	3300Ω			
R16	68K			
R17	3300Ω			
R18	470K			
R19	68K			
R20	3300Ω			
R21	1meg			

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R22	33K			
R23	220K			
R24	3300Ω			
R25	470K			
R26	12K			
R27	68K			
R28	68K			
R29	3300Ω			
R30	68K			
R31	3300Ω			
R32	470K			
R33	68K			
R34	3300Ω			
R35	10K	1		
R36	1500Ω	2		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .24A	580 VCT @.012A	6.3 VCT @1.8A	352-17					25R02①	

① Drill new mounting holes

MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M1	Lamp		#1847

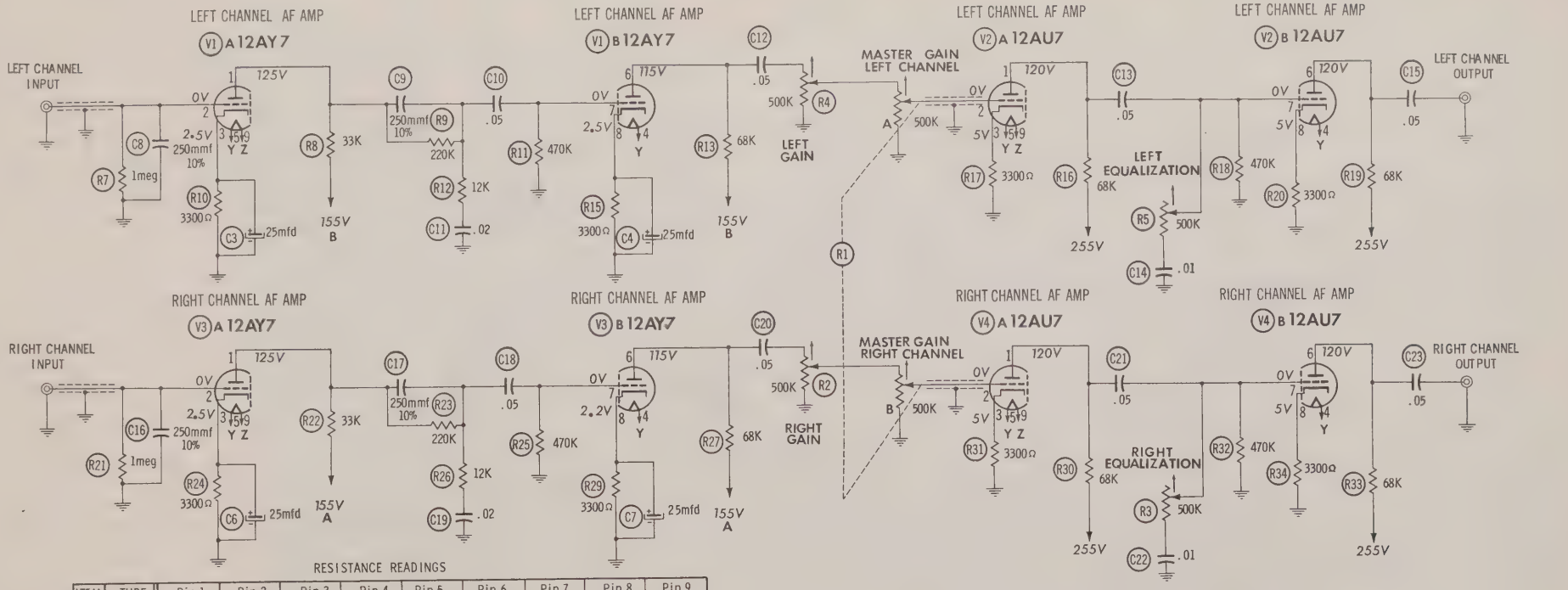
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PENTRON
MODEL CA-15

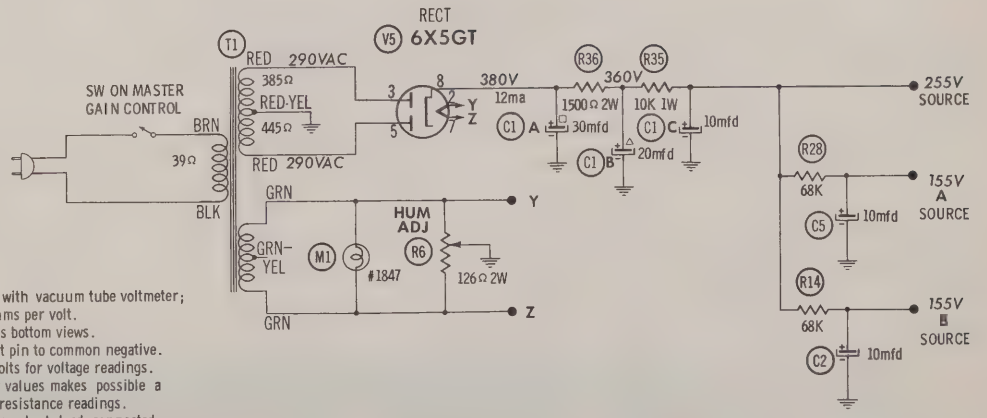
FOLDER 11



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AY7	†110K	1meg	3300Ω	30Ω	30Ω	†145K	470K	3300Ω	30Ω
V2	12AU7	†78K	0Ω	3300Ω	30Ω	30Ω	†78K	470K	3300Ω	30Ω
V3	12AY7	†110K	1meg	3300Ω	30Ω	30Ω	†145K	470K	3300Ω	30Ω
V4	12AU7	†78K	0Ω	3300Ω	30Ω	30Ω	†78K	470K	3300Ω	30Ω
V5	6X5GT	TP	30Ω	385Ω	TP	445Ω	TP	30Ω	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
TP TIE POINT



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PENTRON MODEL CA-15

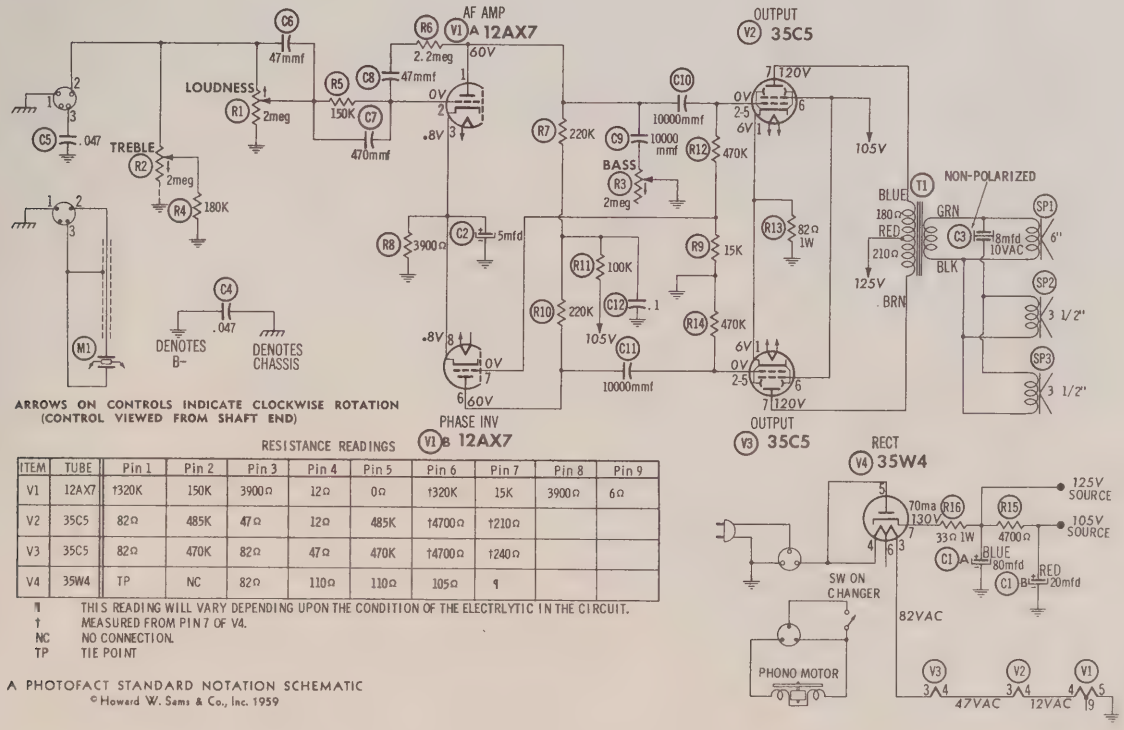
PHOTOFACT* Folder

EIA

PHONOLA
MODEL 1058

TRADE NAME	Phonola Model 1058
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minnesota
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES	Four
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 30 Watts, .32 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M 1200A PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10.



ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†320K	150K	3900Ω	12Ω	0Ω	†320K	15K	3900Ω	6Ω
V2	35C5	82Ω	485K	47Ω	12Ω	485K	†4700Ω	†210Ω		
V3	35C5	82Ω	470K	82Ω	47Ω	470K	†4700Ω	†240Ω		
V4	35W4	TP	NC	82Ω	110Ω	110Ω	105Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTRLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION.
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHONOLA
MODEL 1058

PHONOLA
MODEL 1058

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 441 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Output	35C5	
V3	Output	35C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	12018	PRS150V8020	BBRT44215	TCT3116	TDLD-10	TVA-2460	
B	20	150							
C2	5	6	12869	SRE6V5	BBR5-6	TT6X5	ML5-6	TE-1084	
C3	8	10VAC		AC-PRS10V8	BBR16-90 † BBR16-90	TC108	TD-16-150 † TD-16-150	TVAS-1112*	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	PHONOLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.047	400		12492	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C5	.047	400		12492	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C6	47			11148	DI-47	DD-470	L10Q47	CNO-447	5GA-Q47	
C7	470			11546	DI-470	DD-471	L10T47	B-347	5GA-T47	
C8	47			11148	DI-47	DD-470	L10Q47	CNO-447	5GA-Q47	
C9	10000			12550	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000			12550	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	10000			12550	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	.1	200		11977	P288N-1	DF-104	CUB2P1	GEM-401	2TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	12400	B-76	A47-2meg-Z	Q13-139	U55	Loudness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Bushing			AK-26 †	XB-2 †	S4 †	EB158 †	
R2A	2meg	½	12400	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Bushing			AK-26 †	XB-2 †	S4 †	EB158 †	
R3A	2meg	½	12400	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Bushing			AK-26 †	XB-2 †	S4 †	EB158 †	

† Saw off adaptor bushing to length required and enlarge mounting hole to accommodate adaptor bushing.

RESISTORS

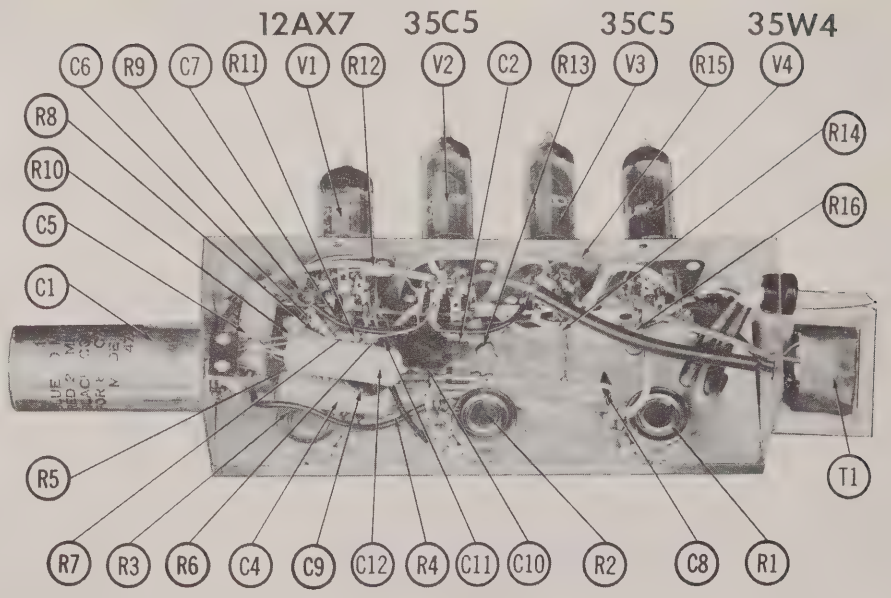
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PHONOLA PART No.	NOTES
R4	180K		12880	
R5	150K		10303	
R6	2. 2meg		10302	
R7	220K		9513	
R8	3900Ω		9305	
R9	15K		13157	
R10	220K		9513	
R11	100K		9892	
R12	470K		12874	
R13	82Ω	1	10305	
R14	470K		12874	
R15	4700Ω		10429	
R16	33Ω	1	12877	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4300Ω CT	3-4Ω	12933	Z1001	A-2900	AU-608	A-3856	24S60	S-51X	

CHASSIS-BOTTOM VIEW



SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	PHONOLA PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	12963	6A21	
SP2	3½"	PM	6-8Ω	12908	3A15TZ7	
SP3	3½"	PM	6-8Ω	12908	3A15TZ7	

PHONO CARTRIDGE

ITEM No.	PHONOLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	WC13203	81-TX				

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	12126-3E	3 Used
Case	1058	
Handle	13144	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PRECISION MODEL 60PA

PRECISION
MODEL 60PA

PRECISION
MODEL 60PA

TRADE NAME	Precision Model 60PA		
MANUFACTURER	Precision Electronics, Inc., 9101 King St., Franklin Park, Illinois		
TYPE SET	AC Operated 8 Tube, 4 Channel Audio Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	130 Watts, 1.1 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H970

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	7025	①
V2	AF Amplifier	12AX7	
V3	AF Amp. - Phase Inv.	12AX7	
V4	Output	EL34/6CA7	

ITEM No.	USE	TYPE	NOTES
V5	Output	EL34/6CA7	
V6	Voltage Regulator	6973	
V7	Rectifier	5U4GB	
V8	Rectifier	5U4GB	

① Some versions may use 12AX7 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	PRECISION PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	▲40	500		AFH3-52	C0390			TVLS-3963 *		
B	■20	500			BR1250					
C	▲20	500								
C2A	■10	350		AFH2-47	B0370	FP231	TMD-47	TVL-2750		
B	▲10	350								
C3A	■10	250		AFHS3-107-50	A0430	FP384.16	TMS-49	TVLS-2500 *		
B	▲100	15			BBR100-15		TD-100-15			
C4	50	50		PRS50V50	BR505	TC39	TD-50-50	TVA-1308		
C5	50	50		PRS50V50	BR505	TC39	TD-50-50	TVA-1308		

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

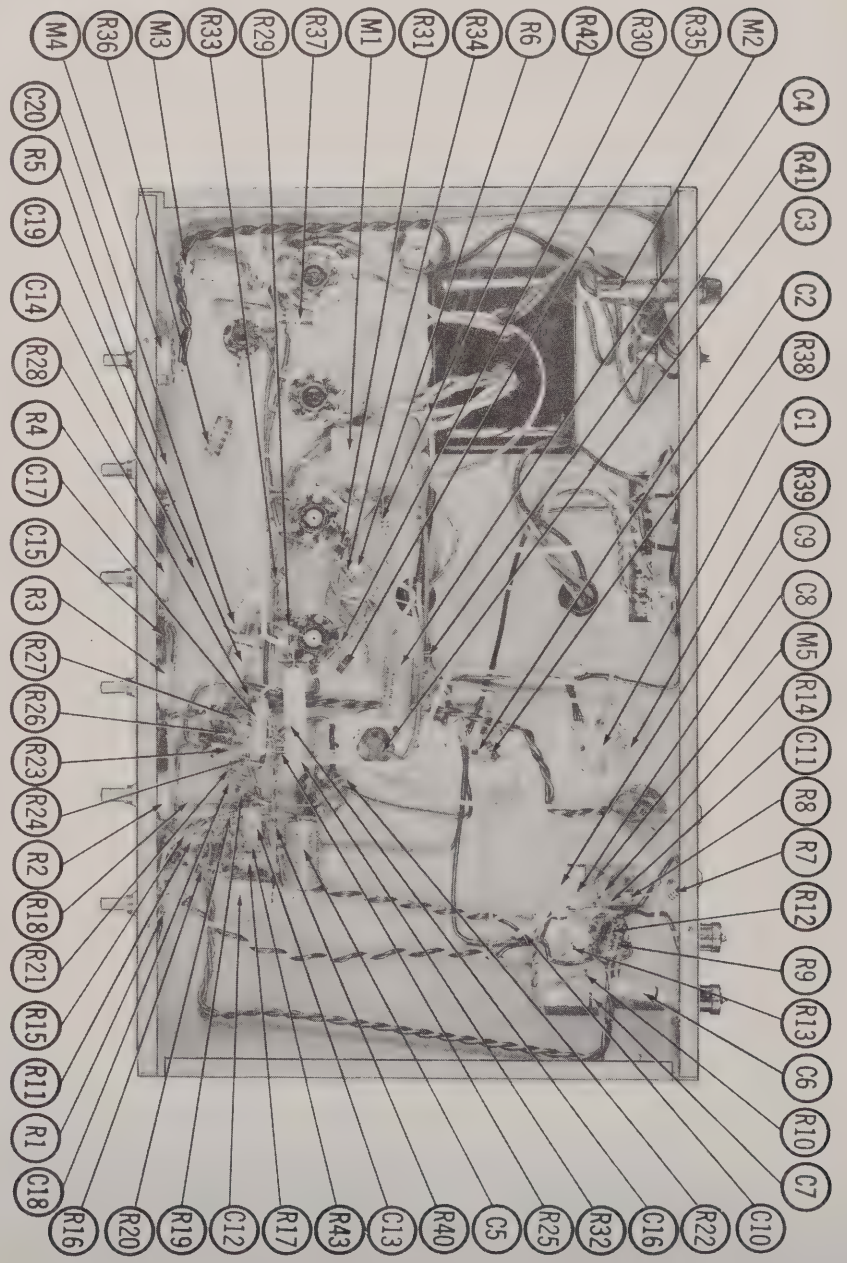
ITEM No.	RATING			REPLACEMENT DATA							NOTES
	CAP.	VOLT	TOL	PRECISION PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C6	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C7	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C8	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C9	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C10	3000		10%		DI-3000				5HK-D3S	10% *	
C11	800		10%		DI-800				5GA-T8S	10% *	
C12	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1		
C13	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C14	10000				BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C15	470		10%		DI-470	MD-471		JL-347	5GA-T47S	10% *	
C16	250		10%		DI-250	MD-251	L10T25		5GA-T25S	10% *	
C17	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C18	1000		10%		DI-1000			JL-210	5HK-D1S	10% *	
C19	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1		
C20	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PRECISION PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic. 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic. 2, Mag. Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R4A	2meg	½	LFBC2M	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R6A	10K	½	CLU-10K	B-14	A47-10K-S	Q11-116	U20	Bias
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

CHASSIS-BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PRECISION PART No.	NOTES
R7	47K			
R8	10K			
R9	3.3meg			
R10	100K			
R11	470K			
R12	3.3meg			
R13	100K			
R14	100K			
R15	470K			
R16	1meg			
R17	100K			
R18	470K			
R19	10meg			
R20	1000Ω			
R21	100K			
R22	220K			
R23	10K			
R24	100K			
R25	100Ω			
R26	100K			
R27	100K			
R28	1000Ω			
R29	220K			
R30	120K			Note 1
R31	1000Ω			
R32	10Ω	10		
R33	270K			
R34	120K			Note 1
R35	1000Ω			
R36	220K	2		
R37	100K	2		
R38	22K			
R39	10K			
R40	10K			
R41	22K			
R42	18K			
R43	1000Ω			

Note 1. Some versions may use 100K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PRECISION PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.1A SEC. 3 6.3VCT @ 4.5A	800VCT @ .100A Tap @ 105V @ .001A	5V @ 6A	TP75L						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PRECISION PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4000Ω CT	250Ω Tap @ 84Ω (70V), 16Ω, 8Ω	TO75B							

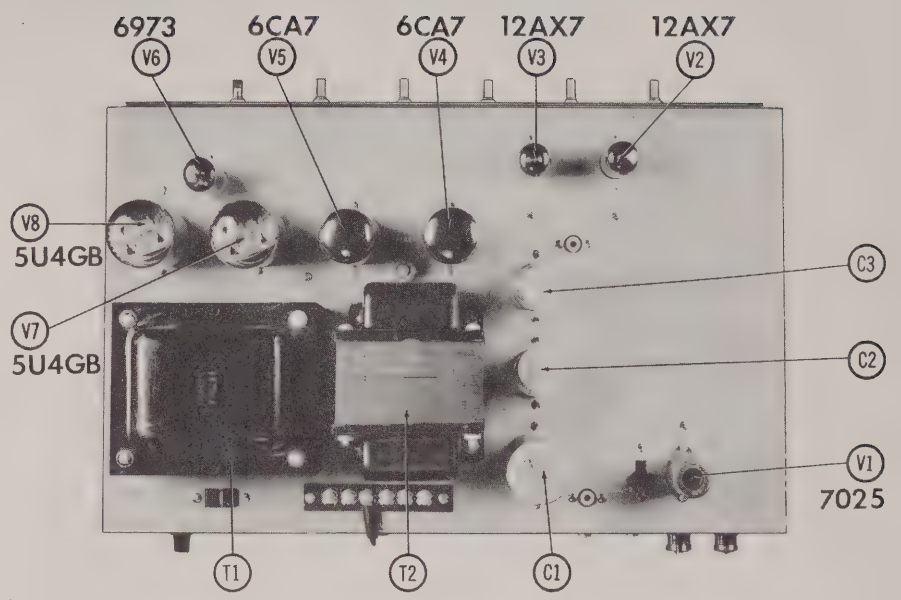
SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA PRECISION PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.001A		1159	D-5410	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PRECISION PART No. FUSE	PRECISION PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	5A 250V			312005. (3AG 5A 250V)	342001	MTH5	HKP

CHASSIS-TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	PRECISION PART No.	NOTES
M3	Lamp		#51 (Not used in some versions.)
M4	Switch		Power On-Off (SPST, Rotary Snap Type)
M5	Switch		Magnetic Pickup-Mic. 2 (DPDT, Slide Type)

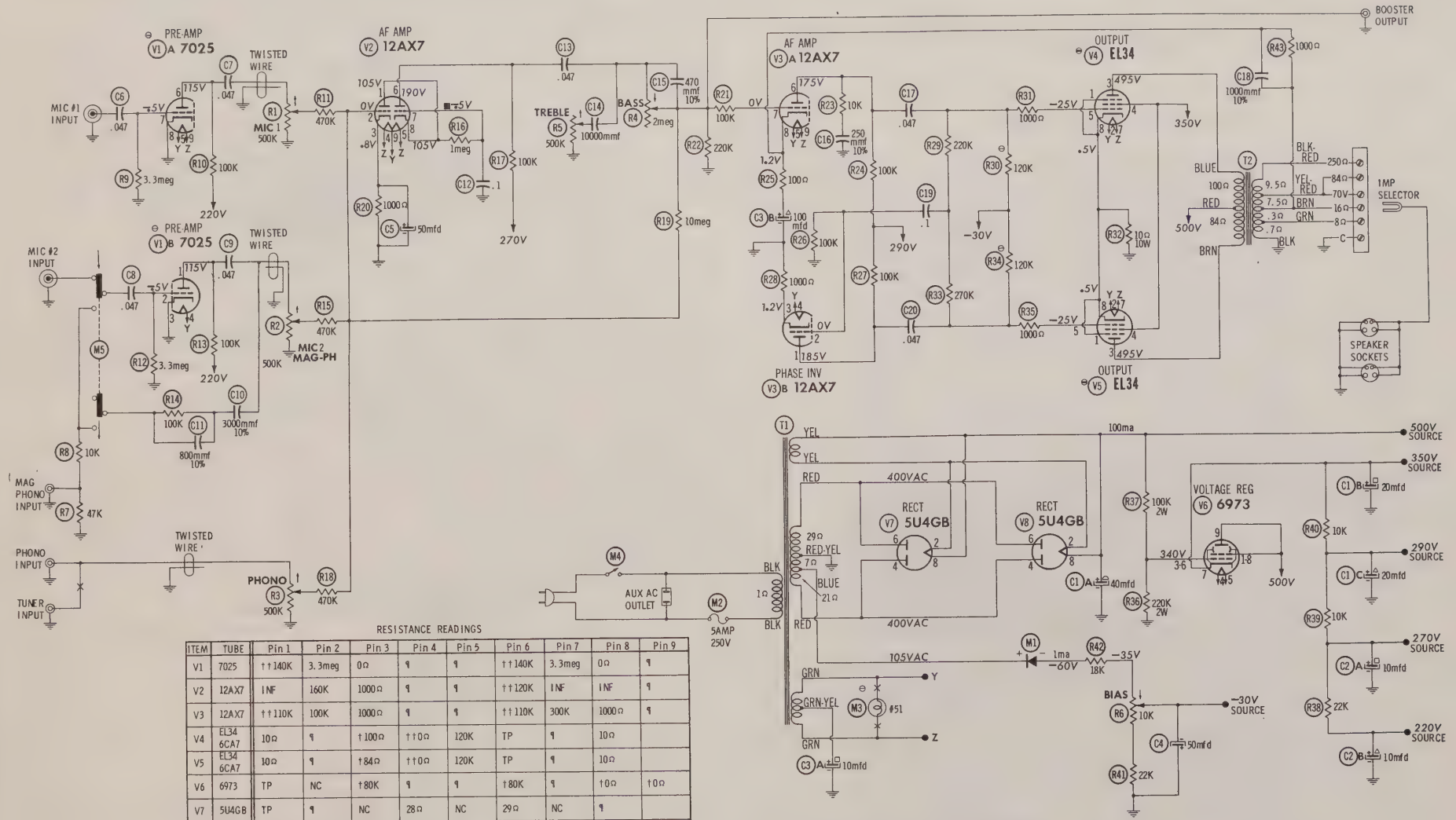
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	††140K	3.3meg	0Ω	¶	¶	††140K	3.3meg	0Ω	¶
V2	12AX7	INF	160K	1000Ω	¶	¶	††120K	INF	INF	¶
V3	12AX7	††110K	100K	1000Ω	¶	¶	††110K	300K	1000Ω	¶
V4	EL34 6CA7	10Ω	¶	†100Ω	††0Ω	120K	TP	¶	10Ω	
V5	EL34 6CA7	10Ω	¶	†84Ω	††0Ω	120K	TP	¶	10Ω	
V6	6973	TP	NC	†80K	¶	¶	†80K	¶	†0Ω	†0Ω
V7	5U4GB	TP	¶	NC	28Ω	NC	29Ω	NC	¶	
V8	5U4GB	NC	¶	NC	28Ω	NC	29Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V8.
†† MEASURED FROM PIN 7 OF V6.
• MEASURED FROM PIN 8 OF V2.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

BIAS ADJUSTMENT (R6)

Connect a DC VTVM from center terminal of R6 to chassis. Adjust R6 for -30 Volts DC.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PRECISION MODEL 60PA

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SHERWOOD MODEL S-1000-II (Revised)

SHERWOOD MODEL S-1000-II (Revised)

SHERWOOD MODEL S-1000-II (Revised)

TRADE NAME	Sherwood Model S-1000-II (Revised)
MANUFACTURER	Sherwood Electronic Laboratories, Inc., 4300 N. California Ave., Chicago 18, Illinois
TYPE SET	AC Operated Audio Amplifier
TUBES	Nine
POWER SUPPLY	110 - 120 Volts AC - 60 Cycles RATING 88 Watts, .87 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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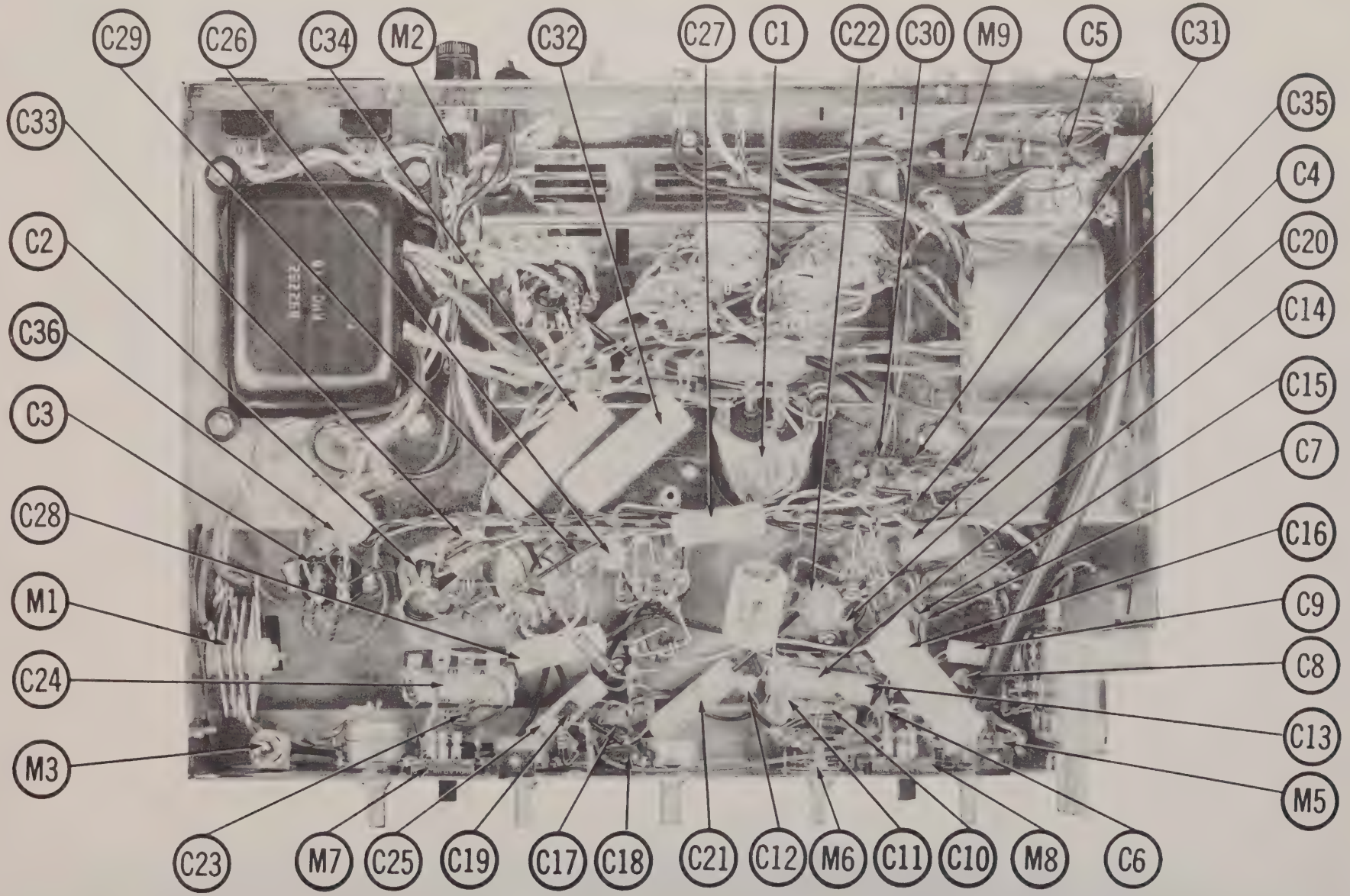
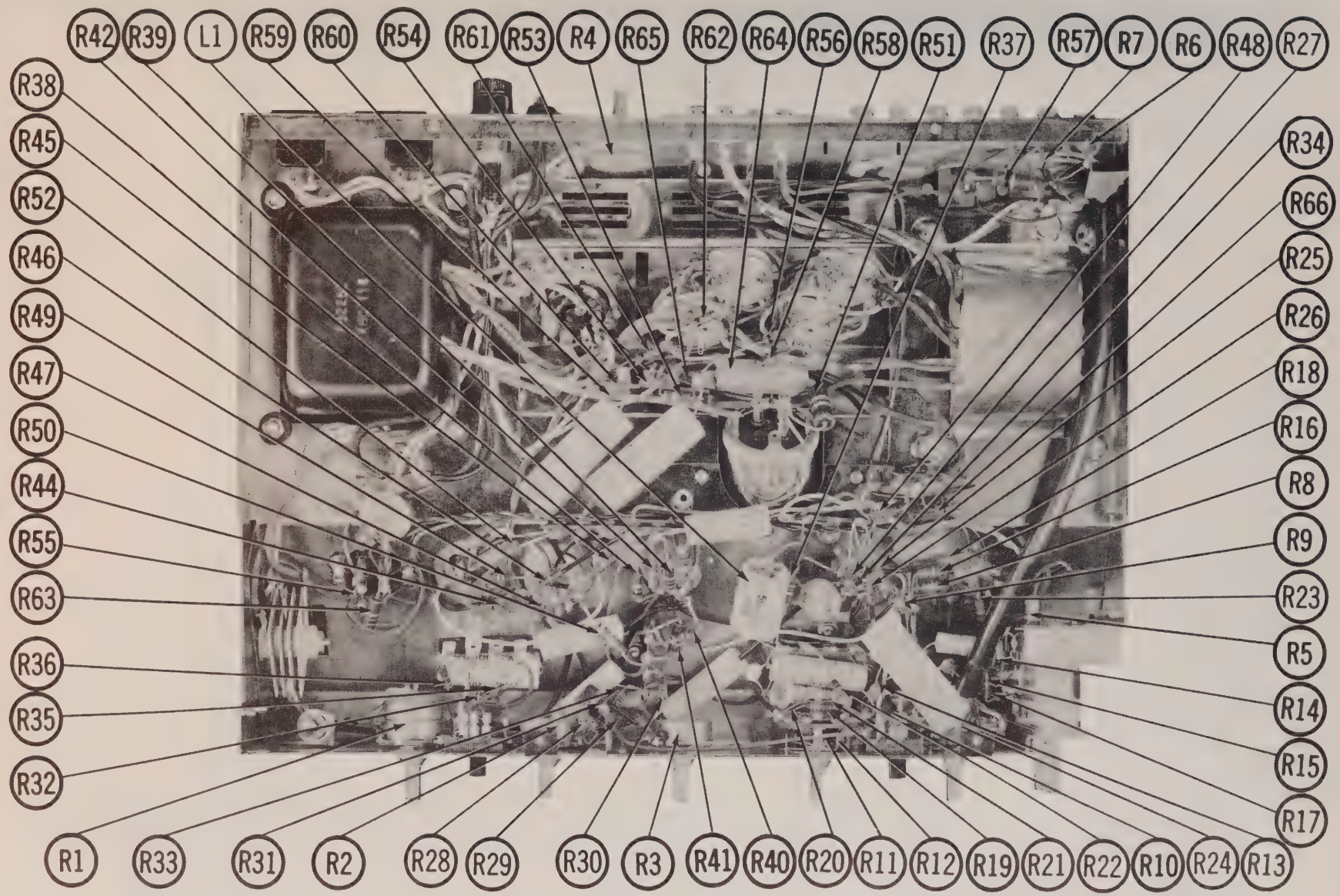
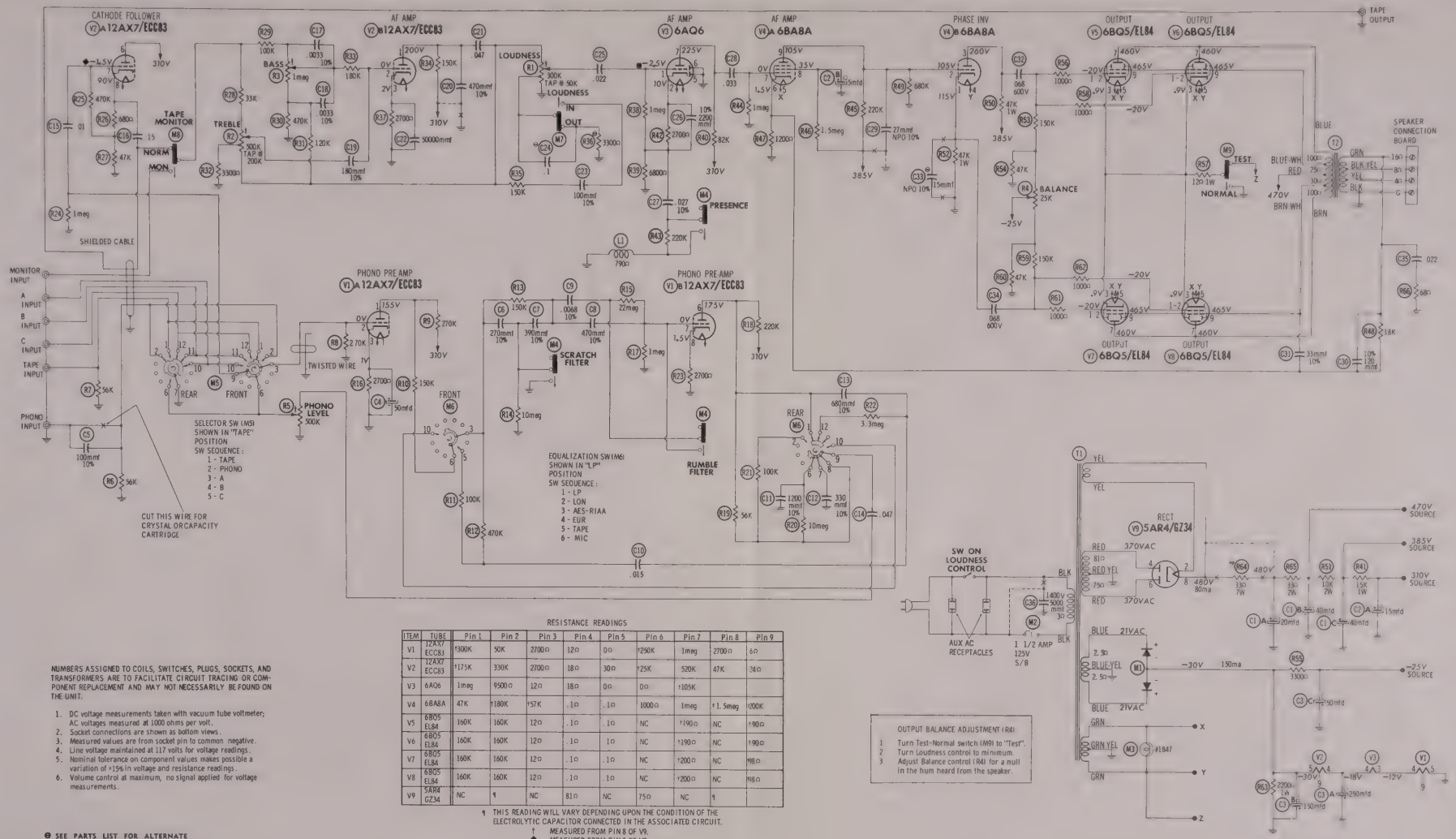


CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

SHERWOOD
MODEL S-1000-II (REVISED)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	†300K	50K	2700Ω	12Ω	0Ω	†250K	1meg	2700Ω	6Ω
V2	12AX7 ECC83	†175K	330K	2700Ω	18Ω	30Ω	†25K	520K	47K	3Ω
V3	6AQ6	1meg	9500Ω	12Ω	18Ω	0Ω	0Ω	†105K		
V4	6BA8A	47K	†180K	†57K	.1Ω	.1Ω	1000Ω	1meg	†1.5meg	†200K
V5	6BQ5 EL84	160K	160K	12Ω	.1Ω	.1Ω	NC	†190Ω	NC	†90Ω
V6	6BQ5 EL84	160K	160K	12Ω	.1Ω	.1Ω	NC	†190Ω	NC	†90Ω
V7	6BQ5 EL84	160K	160K	12Ω	.1Ω	.1Ω	NC	†200Ω	NC	†98Ω
V8	6BQ5 EL84	160K	160K	12Ω	.1Ω	.1Ω	NC	†200Ω	NC	†98Ω
V9	5AR4 GZ34	NC	¶	NC	81Ω	NC	†5Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

† MEASURED FROM PIN 8 OF V9.
◆ MEASURED FROM PIN 8 OF V2.
■ MEASURED FROM PIN 2 OF V3.
NC NO CONNECTION.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Ⓢ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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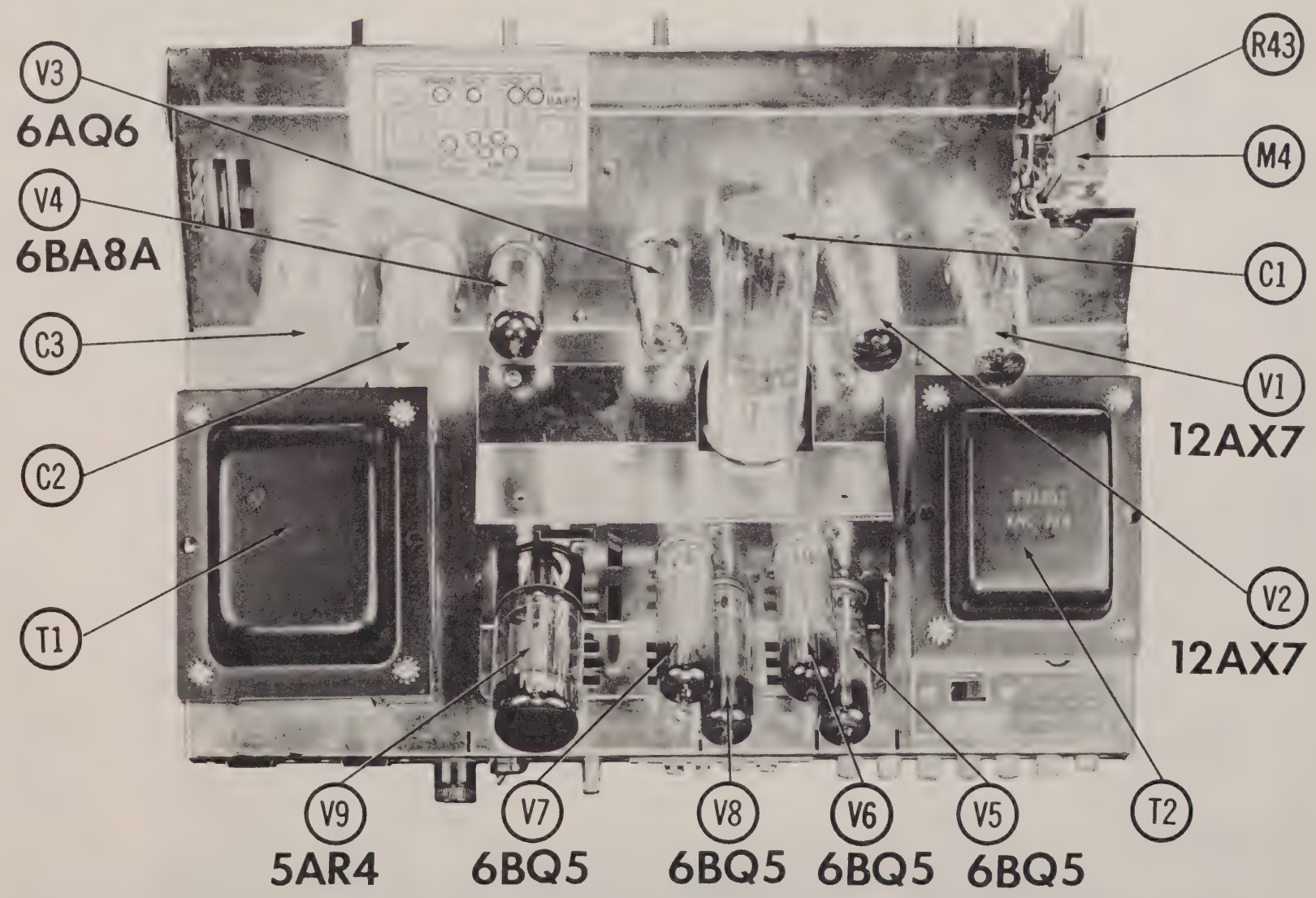
SHERWOOD MODEL S-1000-II (Revised)



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Phono Preamplifier	12AX7/ECC83
V2	Cath. Follower - AF Amp.	12AX7/ECC83
V3	AF Amplifier	6AQ6
V4	AF Amp.-Phase Inverter	6BA8A
V5	Output	6BQ5/EL84
V6	Output	6BQ5/EL84
V7	Output	6BQ5/EL84
V8	Output	6BQ5/EL84
V9	Rectifier	5AR4/GZ34

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SHERWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲ 20	500		AFH3-54	D0185				R2738 *
B	■ 40	500							
C	▲ 40	500							
C2A	▲ 15	400		AFH2-47	A0450	FP143		S-255	R2733 *
B	■ 5	400			BR445	TC70		MT-4504	
C3A	▲ 250	50							R2734 *
B	■ 150	50							
C	▲ 50	50							
C4	50	6		PWE6050	NL50-6	TT6X50	ML50-6	MQ-650	TVA-1100

* Not normally in distributors stock. Available through distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SHERWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	100			1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C6	270				MD-271	L10T27		5TCC-T27	10%
C7	390				MD-391	L10T39			10%
C8	470				MD-471		JL-347		10%
C9	.0068	400					GEM-16268	5BF-D68	10%
C10	.015	400		P488N-015		CUB6S15	GEM-4115	4TM-S15	
C11	1200						JL-212		10%
C12	330				MD-331	L10T33	JL-333		10%
C13	680				MD-681		JL-368		10%
C14	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C15	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C16	.15	200		P288N-15		CUB2P15	GEM-2015	2TM-P15	
C17	.0033	400					GEM-16233	5BF-D33	10%
C18	.0033	400					GEM-16233	5BF-D33	10%
C19	180			1469-00018	DD-181	22R5T18		MS-318	10%
C20	470				MD-471		JL-347		10%
C21	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C22	50000			BPD-05	DF-503			5HK-S5	
C23	100			1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C24	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	①
C25	.022	400		P488N-022	D6-203	CUB4S22	GEM-4122	4TM-S22	
C26	2200						JL-222		10%
C27	.027	400						5BF-S27	10%
C28	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C29	27					C10Q27C	CN0-427		NPO 10%
C30	120			NPO-DI120	DD-121	22R5T12		MS-312	10%
C31	33			NPO-DI33	DD-330	22R5Q33		MS-433	10%
C32	.068	600		P688N-068		CUB6S68	GEM-6168	6TM-S68	
C33	15			NPO-DI15	DTZ-15	C10Q15C	CN0-415	5TCC-Q15	NPO ② 10%
C34	.068	600		P688N-068		CUB6S68	GEM-6168	6TM-S68	
C35	.022	400		P488N-022	D6-203	CUB4S22	GEM-4122	4TM-S22	
C36	5000	1400		HVD-15-5000	DD30-502	HVE16D5		20HK-D5	

① Some versions may use . 22mfd in this application.
② Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SHERWOOD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	300K	½	A671B4	BT-57	A47F1-350K	Q18-132X	UT-425	Loudness, Tap@50K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	500K	½	670AB1	BT-65	A47F5-500K	Q19-133X	UT-421	Treble, Tap@200K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	670AB2	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	25K	½	A670B6	AB-26	B47-25K-S	B11-120	TA253L	Balance
B	Shaft			AK-1	Not Req.	TM2	Not Req.	
R5A	500K	½	670AB7					Phono Level
B	Shaft							

* Use KR with CRL "Red Label" controls and KR with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SHERWOOD PART No.	NOTES
R6	56K			
R7	56K			
R8	270K			
R9	270K			
R10	150K			
R11	100K			
R12	470K			
R13	150K			
R14	10meg			
R15	22meg			
R16	2700Ω			
R17	1meg			
R18	220K			
R19	56K			
R20	10meg			
R21	100K			
R22	3.3meg			
R23	2700Ω			
R24	1meg			
R25	470K			
R26	680Ω			
R27	47K			
R28	33K			
R29	100K			
R30	470K			
R31	120K			
R32	3300Ω			
R33	180K			
R34	150K			
R35	150K			
R36	3300Ω			Note 1

ITEM No.	RATING OHMS	RATING WATT	SHERWOOD PART No.	NOTES
R37	2700Ω			
R38	1meg			
R39	6800Ω			
R40	82K			
R41	15K	1		
R42	2700Ω			
R43	220K			
R44	1meg			
R45	220K			
R46	1.5meg			
R47	1200Ω			
R48	18K			
R49	680K			
R50	47K	1		
R51	10K	2		
R52	47K	1		
R53	150K			
R54	47K			
R55	3300Ω			
R56	1000Ω			
R57	12Ω	1		
R58	1000Ω			
R59	150K			
R60	47K			
R61	1000Ω			
R62	1000Ω			
R63	2200Ω	1		
R64	33Ω	7		Note 2
R65	33Ω	2		
R66	68Ω			

Note 1. Some versions may use 1800Ω in this application.
Note 2. Not used in some versions.

COILS

ITEM No.	USE	REPLACEMENT DATA SHERWOOD PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Tone Choke	56-507					140 Millihenries

PARTS LIST AND DESCRIPTIONS (cont)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SHERWOOD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .87A	740VCT @ .080A	5V @ 1.9A	B922B2						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 3.6A	52VCT @ .15A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SHERWOOD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω CT Screen Taps @ 500Ω CT	16Ω Taps @ 8Ω @ 4Ω	B920B2							

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	SHERWOOD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.150A				3N26-2CN1-RV	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SHERWOOD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1½A 125V S/B			31301.5 (1½A 125V S/B)	342001	MDL 1½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	SHERWOOD PART No.	NOTES
M3	Lamp		#1847
M4	Switch		Rumble, Scratch Filter, Presence (SPST, Slide, Spring Return Type)
M5	Switch		Input Selector, (5 Position, Rotary Wafer Type)
M6	Switch		Equalization, (6 Position, Rotary Wafer Type)
M7	Switch		Loudness, (SPDT, Slide Type)
M8	Switch		Tape Monitor, (SPDT, Slide Type)
M9	Switch		Test-Normal, (SPDT, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

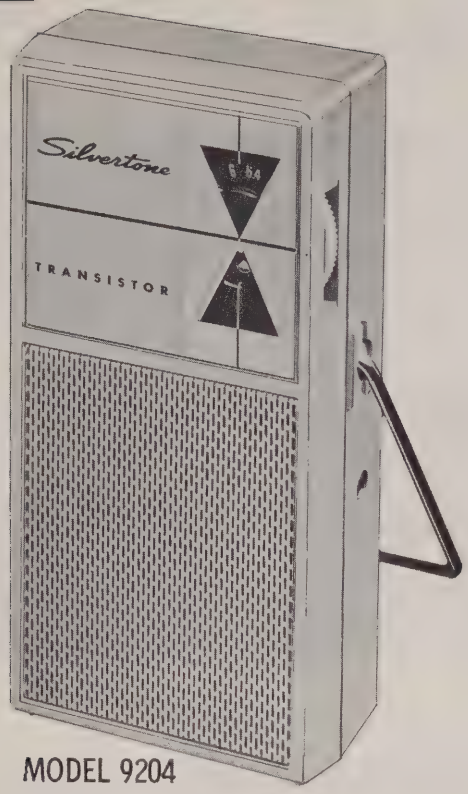
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

with CIRCUITRACE*

SILVERTONE MODELS 9204, 9205, 9206 (Ch. 132.43600)

SILVERTONE MODELS 9204, 9205, 9206 (Ch. 132.43600)



MODEL 9204

TRADE NAME	Silvertone Models 9204, 9205, 9206 (Ch. 132.43600)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	540 - 1650KC
RATING	8.5MA @ 9 Volts DC (No Signal, Min. Volume) 10MA @ 9 Volts DC (Signal Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3
A4, A6.....GENERAL CEMENT #8729, 9291, 9294, 5008, 8728, 5000
WALSCO #2532, 2537, 2522, 2525, 2531
A5.....GENERAL CEMENT #8606, 8606L, 9296
WALSCO #2543, 2544

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to antenna stator lug of tuning gang. Low side to B-.	455KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A5	Adjust for maximum output while rocking tuning gang. Repeat steps 2 & 3.
4.		"	1400KC	Tune for 1400KC signal	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H816

SET 441 FOLDER 15

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N212	Converter	CBS-2N439			2N212	NPN
X2	2N94	1st IF Amplifier	CBS-2N438			2N94	NPN
X3	2N94	2nd IF Amplifier	CBS-2N438			2N94	NPN
X4	2N35	Driver	CBS-2N439			2N35	NPN
X5	2N214	Output				2N214	NPN
X6	2N214	Output				2N214	NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	10	44397-2						VL-2350
B	80	10							
C2	65	10	44396-3		NLW75-10	TT10X60			TES-1119.1

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	50000		44684-13						
C4	680		44398-681	1467-00068	DD-681	1W5T68	UC-5368	1FM-368	
C5	10000		43674-11	BPD-01	DD-103	BYA6S1	DC511	TG-S10	
C6	20000		43674-13						
C7	13		43957-14						
C8	470		44398-471	1467-00047	DD-471	1W5T47	UC-5347	1FM-347	
C9A	20000		44684-4						
B	20000								
C10	16		43957-7						
C11A	20000		44684-4						
B	20000								
C12	470		44398-471	1467-00047	DD-471	1W5T47	UC-5347	1FM-347	
C13	50000		44684-13					TG-S50	
C14	100000		44684-9	BPD-01	DD-103	BYA6S1	DC511	TG-P10	
C15	50000		44684-13					TG-S50	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2200Ω	½	45000-2					Volume & Switch

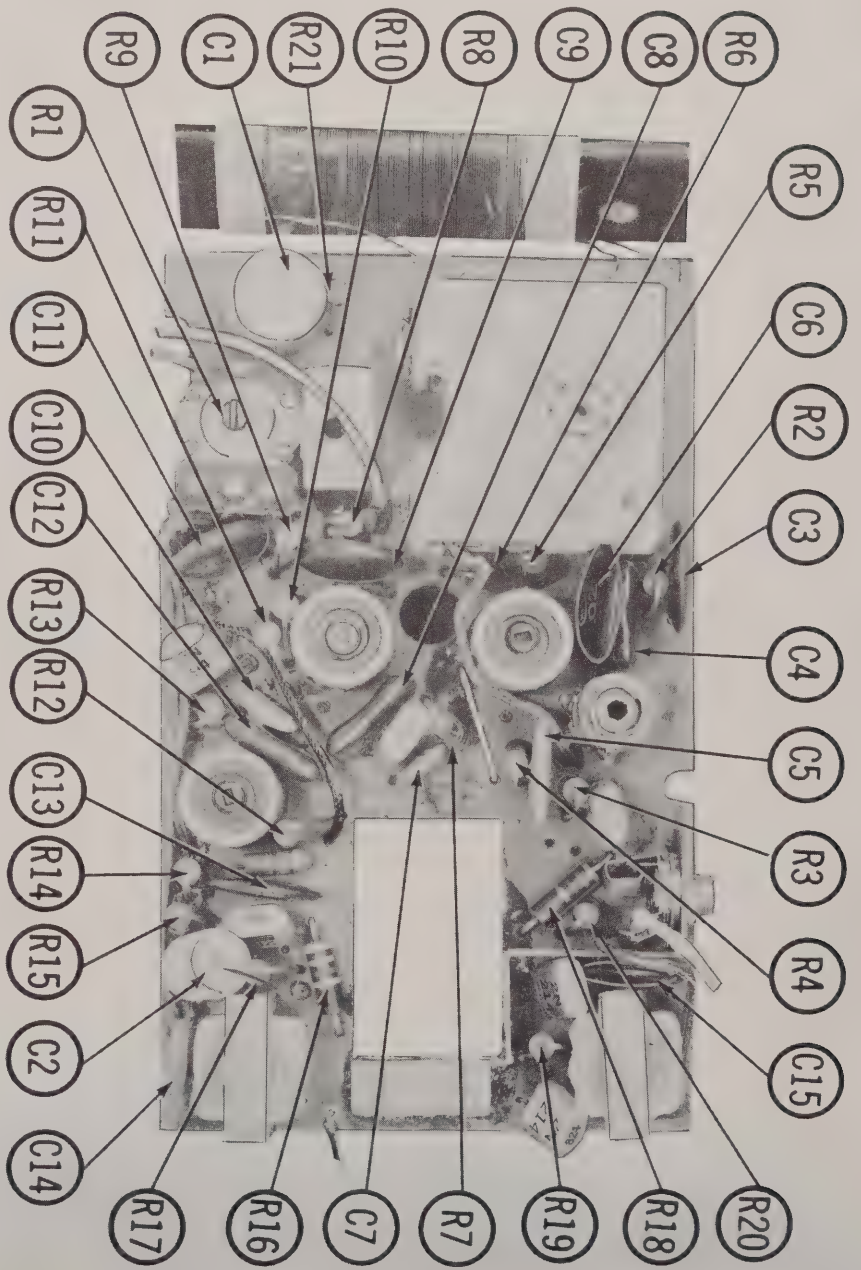
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R2	27K		22381-273	
R3	3900Ω		22381-392	
R4	3300Ω		22381-332	
R5	5600Ω		22381-562	
R6	47K		22381-473	
R7	820Ω		22381-821	
R8	1000Ω		22381-102	
R9	47K		22381-473	
R10	3300Ω		22381-332	
R11	470Ω		22381-471	

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R12	4700Ω		22381-472	
R13	1000Ω		22381-102	
R14	220Ω		20061-221	
R15	47K		22381-473	
R16	4700Ω		43689-472	
R17	470Ω		22381-471	
R18	6200Ω 5%		44052-622	
R19	6200Ω 5%		22382-622	
R20	10Ω		22381-100	
R21	220Ω		20061-221	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	44511-4					
L2	Osc. Coil	45783-2					
L3	1st IF Trans.	44855-1					
L4	2nd IF Trans.	44855-2					
L5	3rd IF Trans.	44855-8					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	: 1	45604-1	GH110		TA-28	TR-4		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	612Ω	17Ω	44858-3	GH105			TA-23	TR-20		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	2 3/4"	PM	17Ω	44280-1		

BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	6418		P6		226		M1600	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SILVERTONE PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295*		1N60	1N295	Detector (Pigtail)

* Some versions may use 1N64G in this application (Part #43959).

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	45483	2 Gang, Ant. 8-124mmf, Osc. 6-83mmf
	Jack	44548	Earphone
	Printed Board	45575-1	

CABINETS & CABINET PARTS

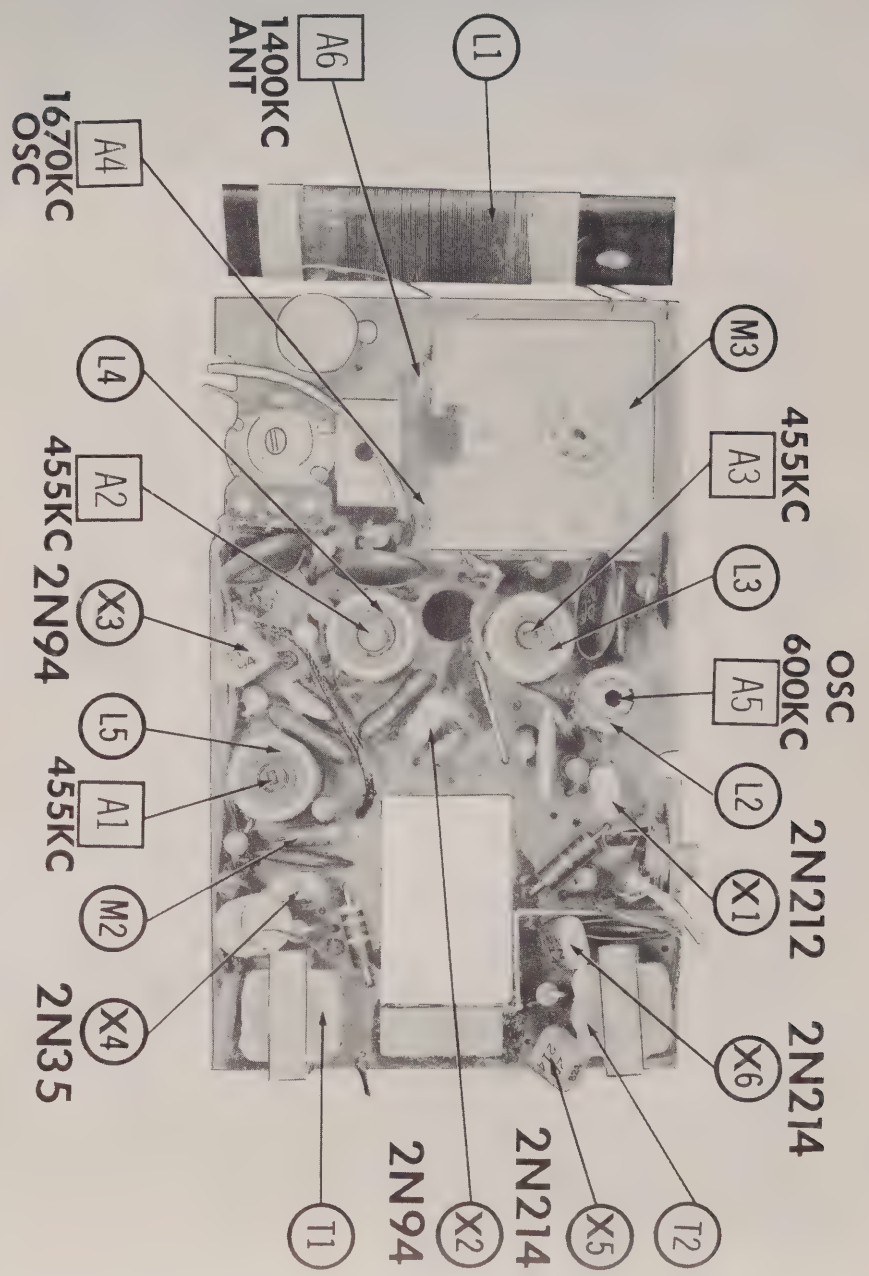
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

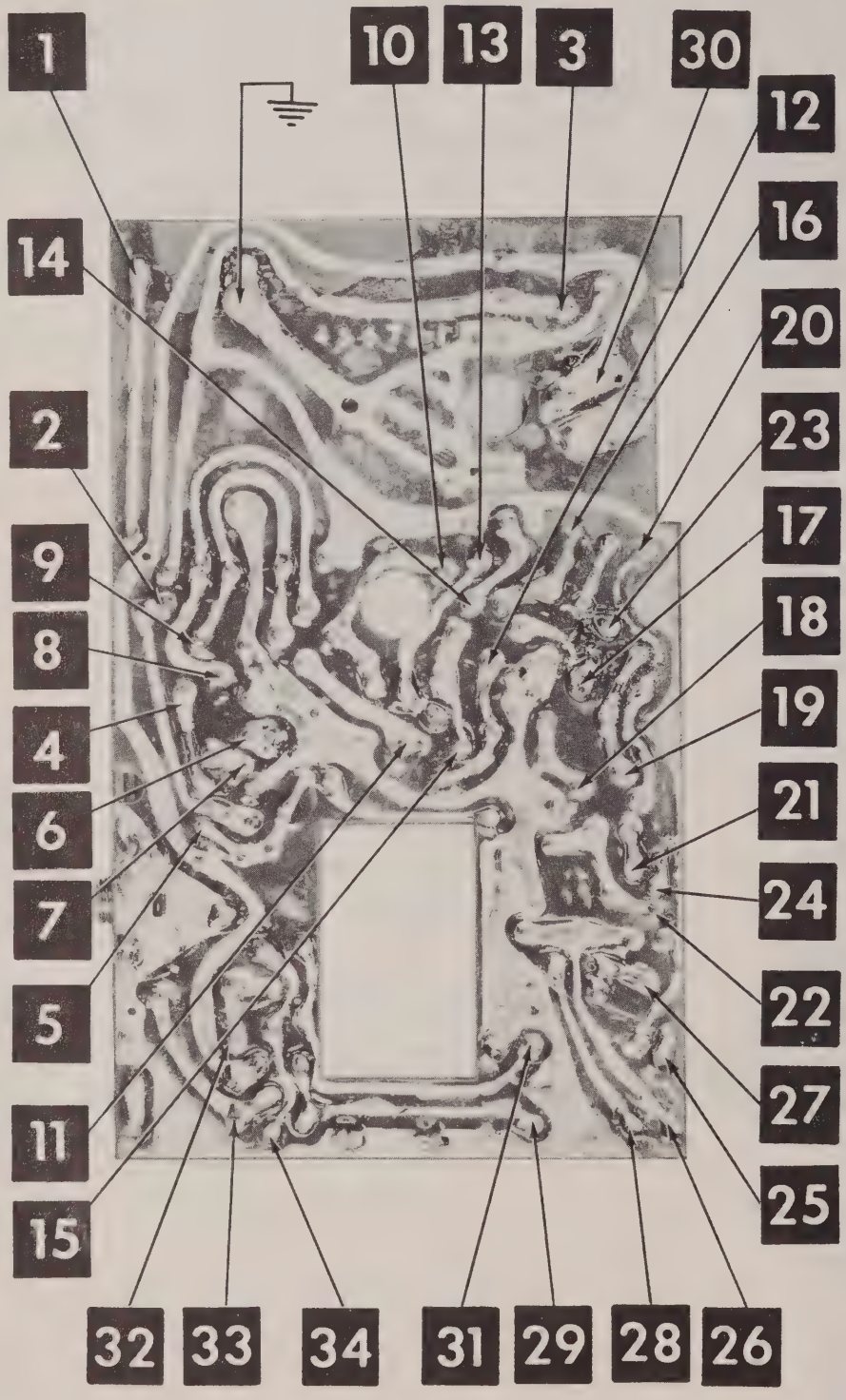
NAME	PART NO.	DESCRIPTION
Knob	45571-59	Tuning, Model 9204
Knob	45571-83	Tuning, Model 9205
Knob	45571-29	Tuning, Model 9206
Knob	44728-59	Volume-On-Off, Model 9204
Knob	44728-83	Volume-On-Off, Model 9205
Knob	44728-29	Volume-On-Off, Model 9206

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW





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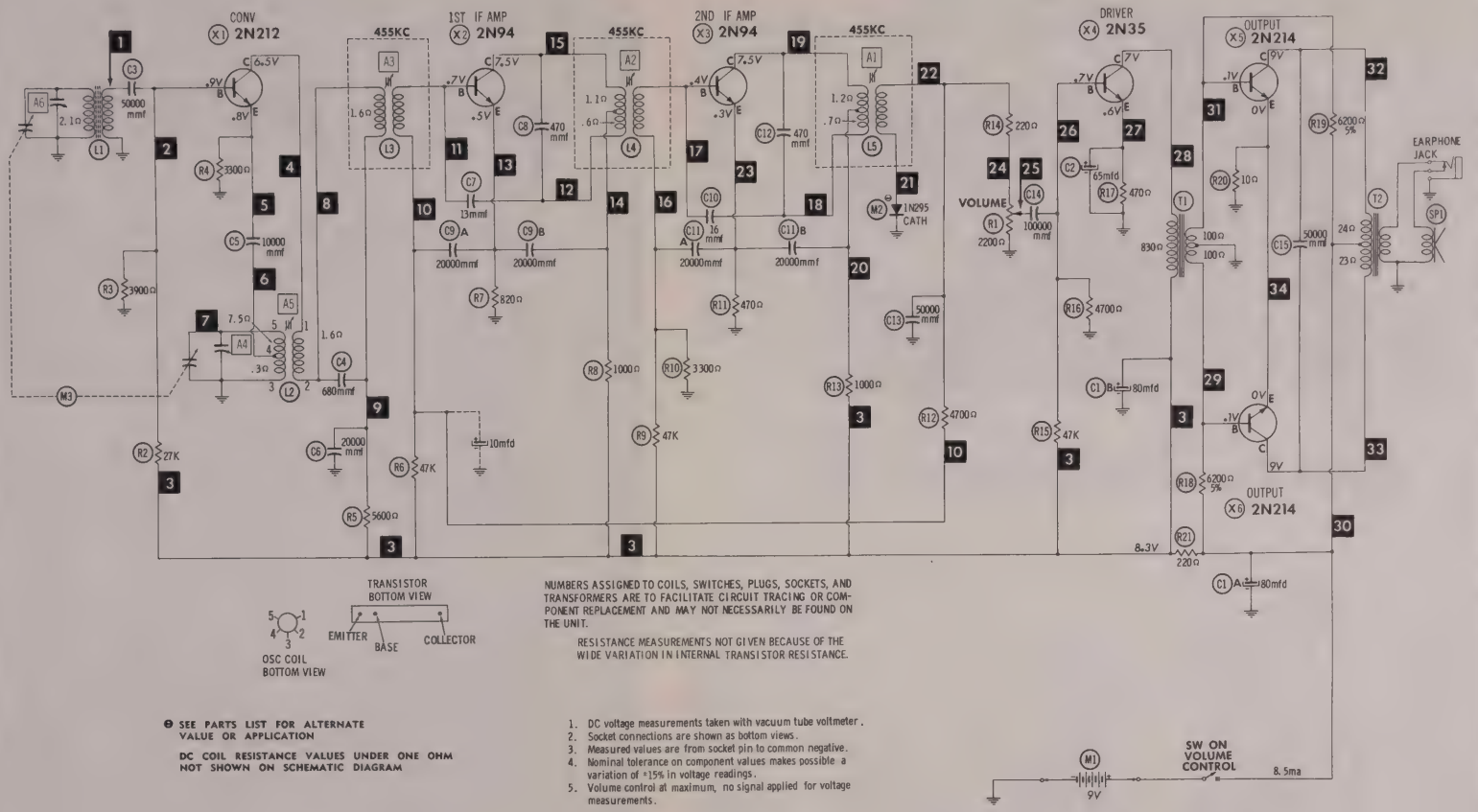
PRINTED BOARD



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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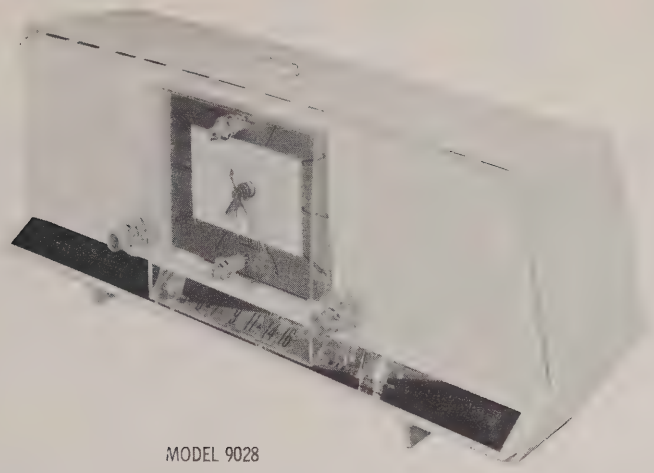
SILVERTONE MODELS 9204, 9205, 9206 (Ch. 132.43600)

PHOTOFACT* Folder with CIRCUITRACE*

SILVERTONE MODELS 9027, 9028, 9029 (Ch. 528.53410, 528.53411)

SILVERTONE MODELS 9027, 9028, 9029 (Ch. 528.53410, 528.53411)



MODEL 9028

TRADE NAME	Silvertone Models 9027, 9028, 9029 (Ch. 528.53410, 528.5341l)
SUPPLIER	Sears, Roebuck & Co. 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES	Six
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles
RATING	25 Watts, .28 Amp. @117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	540 - 1620KC

SILVERTONE MODELS 9027, 9028, 9029 (Ch. 528.53410, 528.53411)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

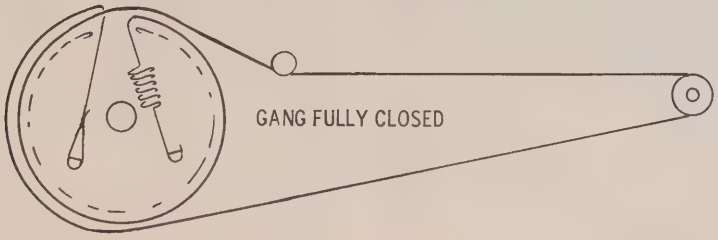
A1 thru A4.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8282, 8728, 8987, 8988
WALSCO #2515, 2531, 2532

A5, A7, A9.....GENERAL CEMENT #5000, 5003, 5004, 5008, 5009, 8276, 8290
WALSCO #2515, 2520, 2523, 2525, 2537

A6, A8.....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd.	High side to grid (Pin 7) of 12BE6 (V2). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	"	"	600KC	600KC	"	A6	"
4.		Loop	600KC	600KC	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
5.		"	1400KC	Tune to 1400KC signal	"	A8, A9	"

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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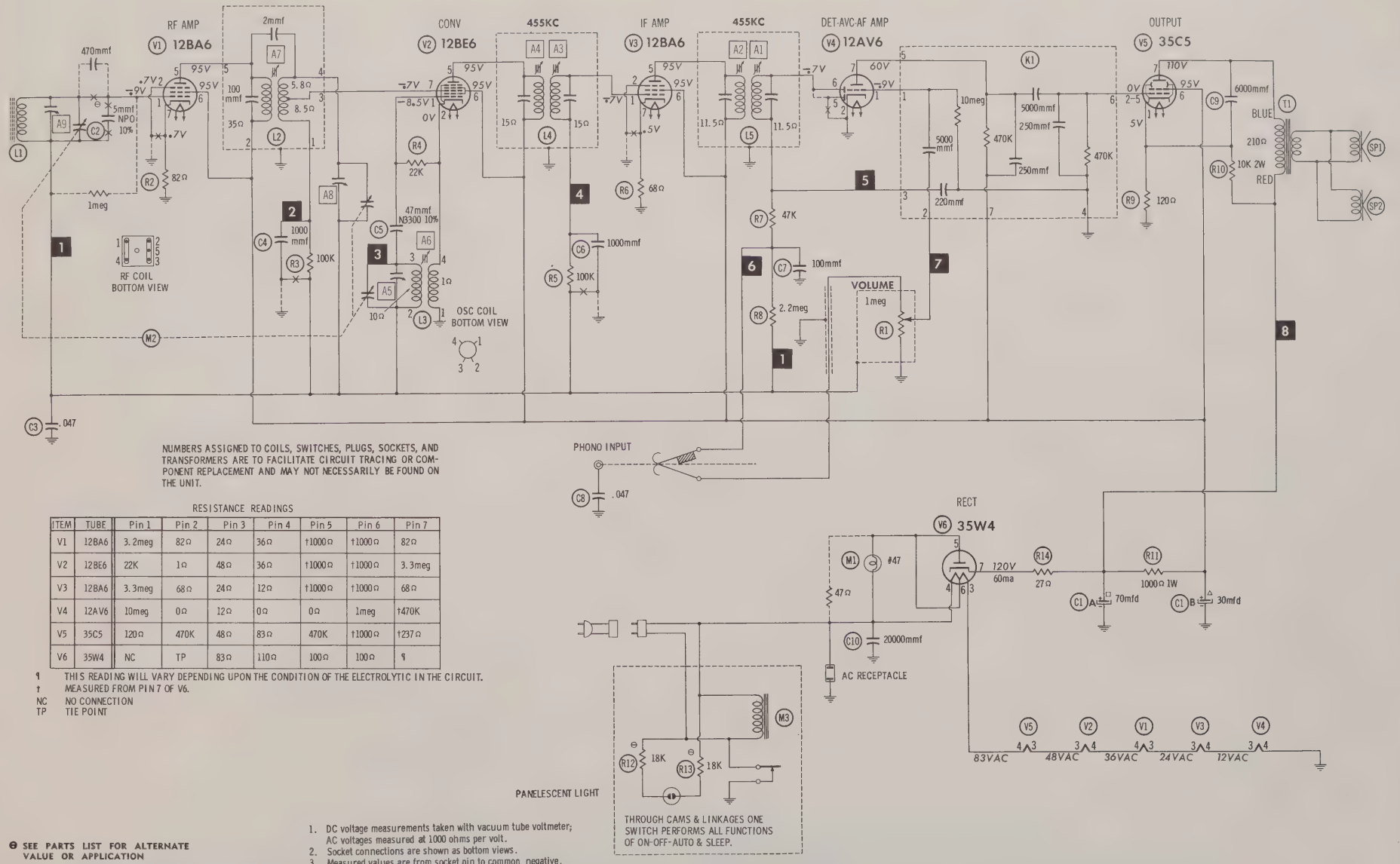
H915

SET 441 FOLDER 16



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	3.2meg	82Ω	24Ω	36Ω	†1000Ω	†1000Ω	82Ω
V2	12BE6	22K	1Ω	48Ω	36Ω	†1000Ω	†1000Ω	3.3meg
V3	12BA6	3.3meg	68Ω	24Ω	12Ω	†1000Ω	†1000Ω	68Ω
V4	12AV6	10meg	0Ω	12Ω	0Ω	0Ω	1meg	†470K
V5	35C5	120Ω	470K	48Ω	83Ω	470K	†1000Ω	†237Ω
V6	35W4	NC	TP	83Ω	110Ω	100Ω	100Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION
TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SILVERTONE MODELS 9027, 9028, 9029 (Ch. 528.53410, 528.53411)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	
V4	Det. -AVC-AF Amp.	12AV6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Silvertone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■70	150	18-58-5	AFH2-17-50	BBRT53215	PFP214.3	TDLT-6	PCL-2441	
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	5		10% NPO		NPO-DI5	DTZ-5	C10V5C	ZT-555	5TCCB-V5	①
C3	.047	200		20-47-1	P288N-047	DF-503	BC6S47J	ACE6147	2SE-S47	
C4	1000			15-10217	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C5	47		N3300 10%	15-470118						
C6	1000			15-10217	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C7	100			15-10116	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C8	.047	400		16-47348	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	6000			15-60216						
C10	20000			15-20317	BPD-02	DD-203	BYB6S2		5HK-S2	

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Silvertone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	24-317-0	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Silvertone PART No.	NOTES
	OHMS	WATT		
R2	82Ω		60-82001	
R3	100K		60-10401	
R4	22K		60-22301	
R5	100K		60-10401	
R6	68Ω		60-68001	
R7	47K		60-47301	
R8	2.2meg		60-22502	

ITEM No.	RATING		Silvertone PART No.	NOTES
	OHMS	WATT		
R9	120Ω		60-12101	
R10	10K	2	60-10321	
R11	1000Ω	1	60-10211	
R12	18K		60-18301	Note 1
R13	18K		60-18301	Note 1
R14	27Ω		60-27001	

Note 1. Chassis 528.5341l uses 27K in this application (Part #60-27301).

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Silvertone PART No.	REPLACEMENT DATA
K1	Audio Coupling Circuit	5000mmf, 5000mmf, 220mmf, 250mmf, 250mmf, 470K, 470K, 10meg	13-14-3	Centralab PC-158 Sprague DT-6

PRINTED BOARD

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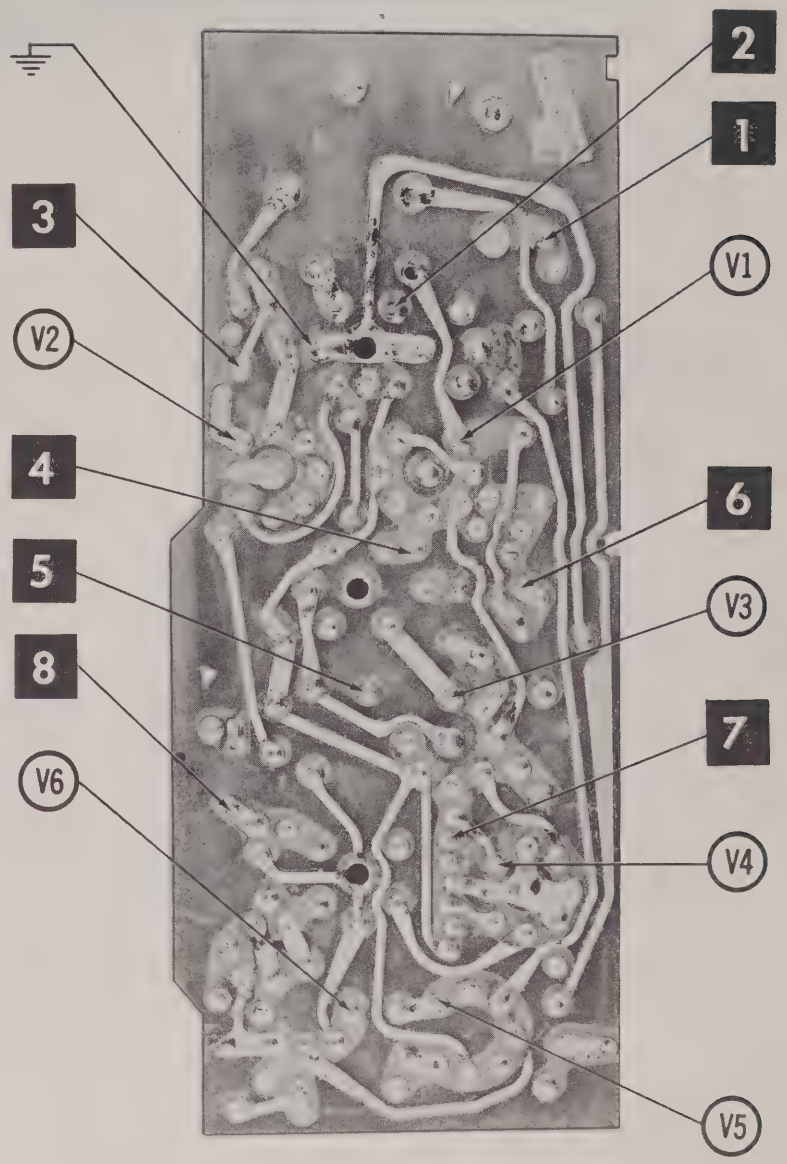
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Silvertone PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	82-148-0					
L2	RF Coil	10-23-0					
L3	Osc. Coil	10-35-4					
L4	Input IF	10-94-2	16-6780	BC-356	13-PC1	RF-4	
L5	Output IF	10-95-2	16-6780	BC-357	13-PC2	RF-4	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Silvertone PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	80-67-1	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	33-363-4	4A07Z6.4	① Includes T1
SP2	4"	PM	6-8Ω	33-364-4①	4A07Z6.4	

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M1	Lamp	89-7	#47
M2	Tuning Cap.	19-27-3	3 Gang
	Printed Board	D25-9-1K	
M3	Clock Timer	59-133	Includes Sweep Second Hand #52-63-1, Minute Hand #52-64-1, Hour Hand #52-65-1, Alarm Set Hand #52-66-1, And Panelescent Light

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

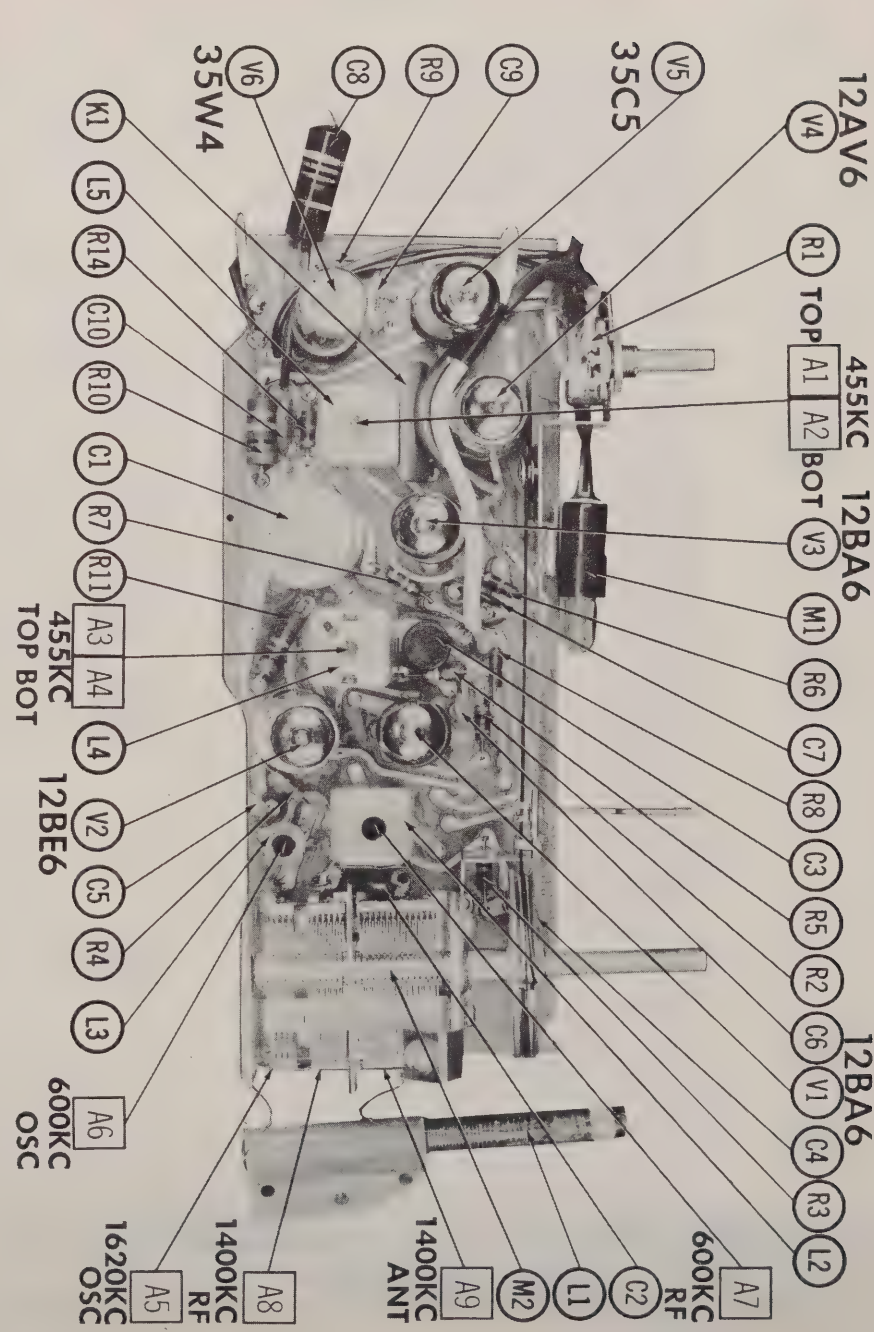
NAME	PART NO.	DESCRIPTION
Knob	52-1093-0	Tuning, Volume
Knob	52-1057-0	Timer, 2 Used
Button	52-1092-0	"Snooz-Alarm"
Cabinet Cover	21-353-0	Ivory, Model 9028
Cabinet Cover	21-352-0	Brown, Model 9027
Cabinet Cover	21-354-0	Pink, Model 9029
Pointer	52-62-1	
Dial Scale	67-650-0	Includes Trim Strip
Timer Window	48-157-1	
Clock Face Insert	67-8-1	Daylight

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



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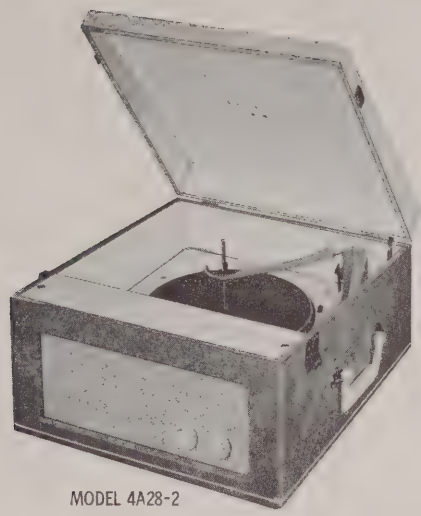
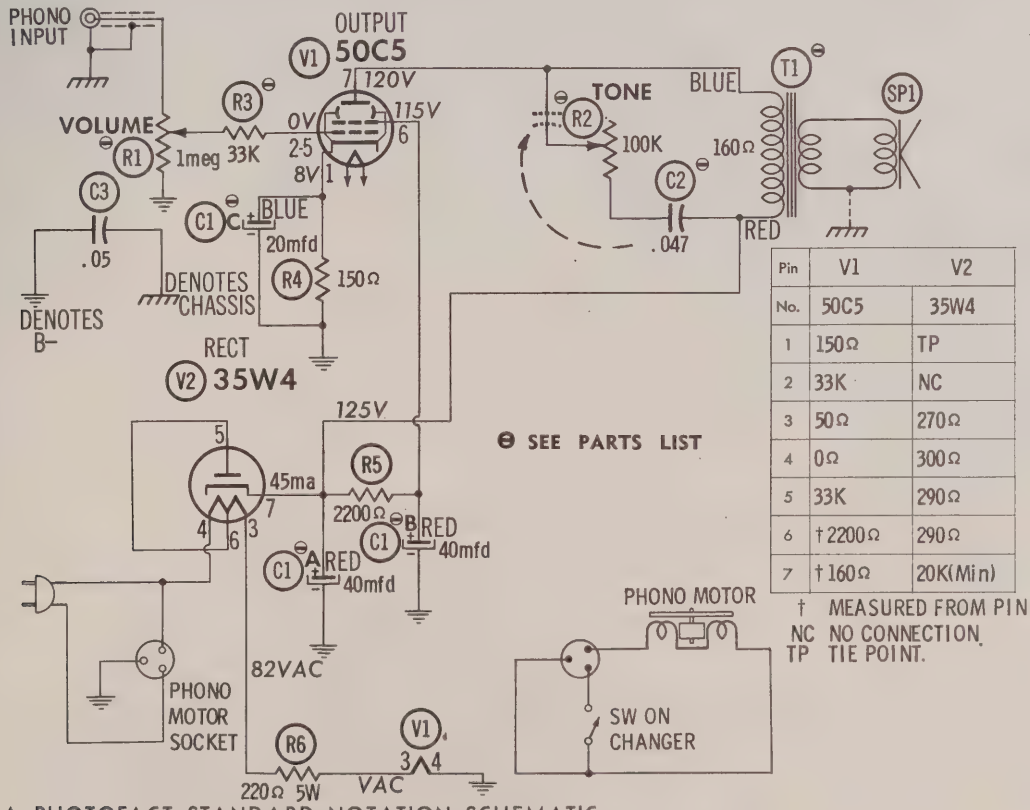


MODEL 4A28-2

TRADE NAME	Steelman Models 4A28, 4A28-1, 4A28-2
MANUFACTURER	Steelman Phono & Radio Co., Inc., 2-30 Anderson Ave., Mount Vernon, N.Y.
TYPE SET	AC Operated Phono Amplifier with 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 24 Watts, .255 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER #300040 USED IN MODELS 4A28 & 4A28-2 - SEE V-M 956 - PHOTOFACT SET 396 FOLDER 13.
FOR SERVICE INFORMATION ON RECORD CHANGER #300402 USED IN MODEL 4A28-1 - SEE MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11.



⊖ SEE PARTS LIST

Pin No.	V1 50C5	V2 35W4
1	150Ω	TP
2	33K	NC
3	50Ω	270Ω
4	0Ω	300Ω
5	33K	290Ω
6	†2200Ω	290Ω
7	†160Ω	20K(Min)

† MEASURED FROM PIN 7 OF V2.
NC NO CONNECTION
TP TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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STEELMAN MODELS
4A28, 4A28-1, 4A28-2
SET 441 FOLDER 17

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V2	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	583020 ①	PRS150V40	BBRT44215	WQ230	TDLT-4	FMT-312	R1110 *
B	40	150		4020					
C	20	150							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Some versions may use Part #583023.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C3	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	360280	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R1A	1meg	½	360081 ①	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	100K	½	360250	B-41	A47-100K-Z	Q13-128	U39	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	100K	½	360050 ①	B-41	A47-100K-Z	Q13-128	U39	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Use KR with CRL "red label" controls and KB with "blue label controls.
① Part number used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R3	33K			Note 1
R4	150Ω			

ITEM No.	RATING		STEELMAN PART No.	NOTES
	OHMS	WATT		
R5	2200Ω			
R6	220Ω	5	510007	

Note 1. Some versions may use 27K in this application.

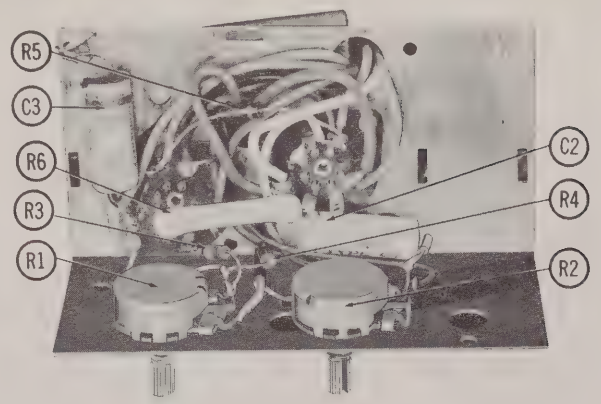
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2200Ω	3-4Ω	430330 ①	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	① Alternate Part #430200

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	404001	4A07	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	321511	120TS	N8-1 & N8-3			Models 4A28, 4A28-2
	322509	420-TS	N8-1 & N8-3			Model 4A28-1

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M2	329307 (78RPM)	†CRA-55 or ♦CRA-55D	†W-64S or ♦ W-64D	Model 4A28-1
	329107 (LP)	†CRA-55LP or ♦CRA-55LPD	†W-64MGS or ♦W-64MGD	
	329308 (78RPM)	†CRA-55 or ♦CRA-55D	†W-64S or ♦W-64D	Models 4A28, 4A28-2
	329108 (LP)	†CRA-55LP or ♦CRA-55LPD	†W-64MG3 ♦W-64MGD	

† Jewel ♦ Diamond

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	270430	Loudness
Knob	240431	Tone
Case	231055	Models 4A28, 4A28-2
Case	270770	Model 4A28-1

WIRING DATA

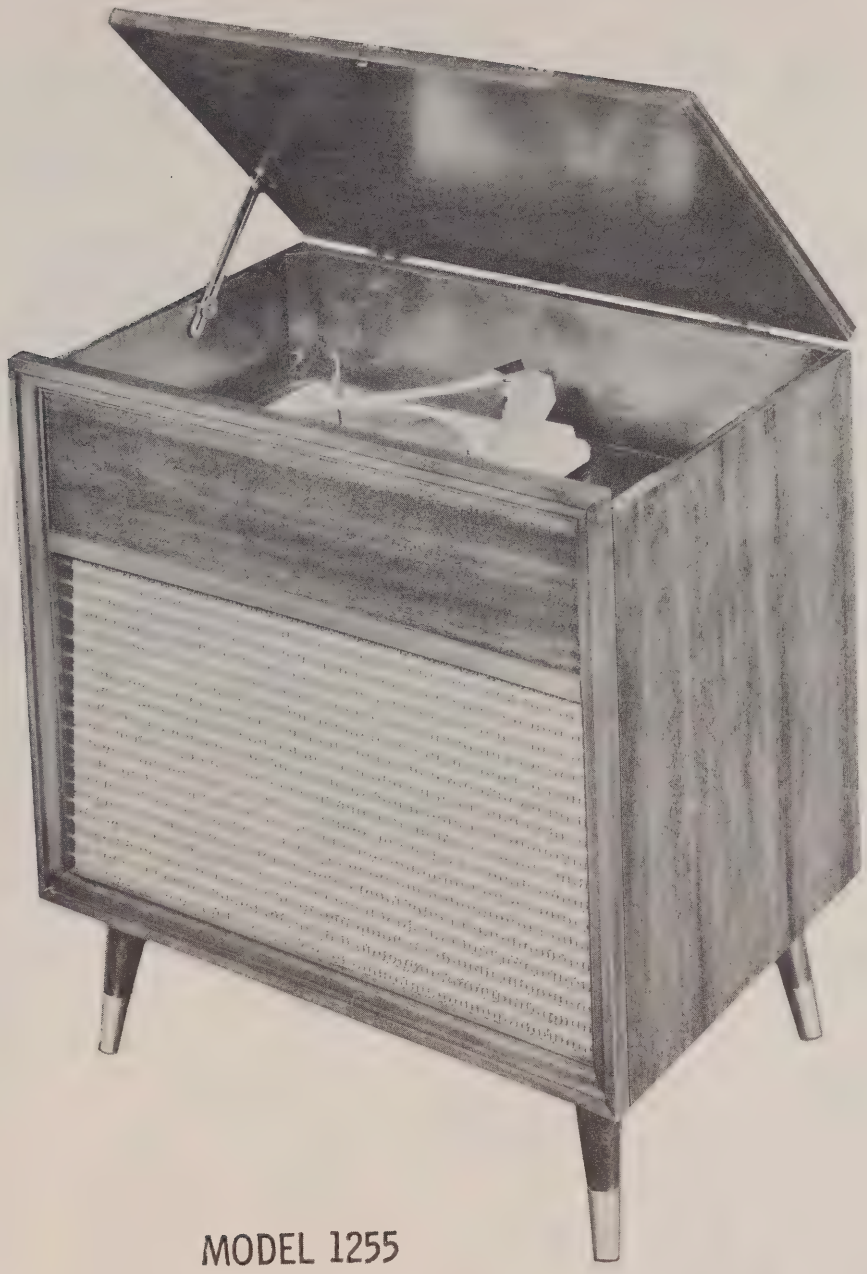
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SYMPHONIC MODELS 1255, 1261, 1262, 1265, 1290, 1298

SYMPHONIC MODELS 1255, 1261, 1262, 1265, 1290, 1298



MODEL 1255

SYMPHONIC MODELS 1255, 1261, 1262, 1265, 1290, 1298

TRADE NAME	Symphonic Models 1255, 1261 (Below Serial #3000), 1262, 1265, 1290, 1298
MANUFACTURER	Symphonic Radio & Electronics Corp., 235 Jersey Ave., New Brunswick, N.J.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES	Three
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 27 Watts, .31 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H802

SET 441 FOLDER 18

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Output	50C5	
V3	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYMPHONIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	CE-101 ①	PRS150V80 4020	BBRT84215		TDLT-7	FMT-339	R2736 *
B	40	150							
C	20	150							

① Model 1265 uses Part #CE-109. Model 1290 uses 40-30-20mfd (Part #CE-100).
* Not normally in distributor stock. Available through distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SYMPHONIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C3	680		CC-101	BPD-0068	DD-681	L10T68	B-368	5GA-T68	
C4	100		CC-102	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C5	.25	200		P288N-25		CUB2P25	GEM-2025	2TM-P25	
C6	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C7	10000		CC-100	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	①
C8	10000		CC-100	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C9	10000		CC-100	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C11	.5								

① Some versions may use .05mfd in this application (Part #CP-210).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	SYMPHONIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	VC-107 ①	B-70	A47-1meg-Z	Q13-137	U53	Loudenss
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	VC-108 ①	B-59	A47-500K-S	Q11-133	U50	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	50K	½	VC-109 ①	B-32	A47-50K-Z	Q13-123	U33	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

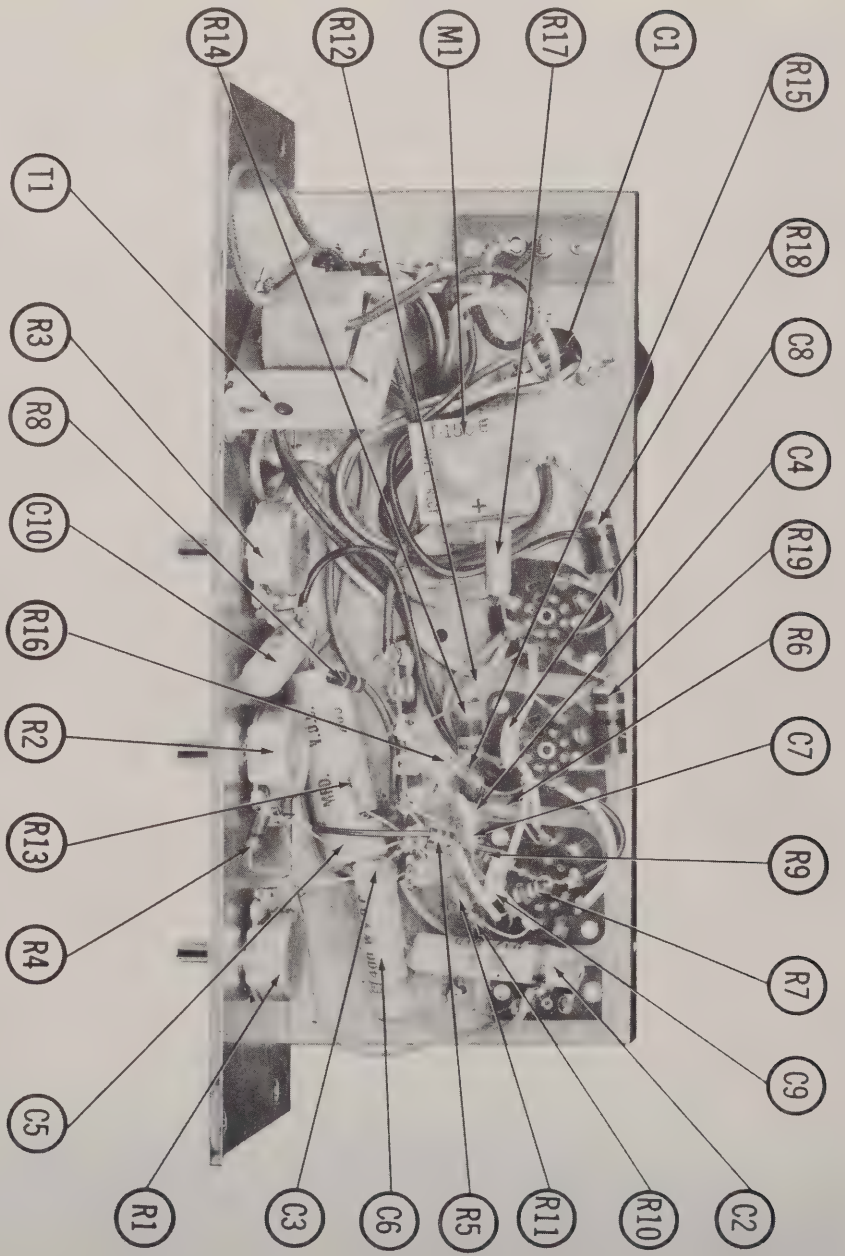
① Part #VC-100 100K Bass, Part #VC-101 500K and Part #VC-102 1meg used in Model 1290.
Part #VC-119 1meg, Part #VC-163 500K , and Part #VC-164 50K used in Models 1262 and 1298.
Part #VC-167 50K, Part #VC-168 500K and Part #VC-169 1meg used in Model 1265.
Part #VC-107 1meg, Part #VC-108 500K, and Part #VC-109 50K used in Model 1261.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SYMPHONIC PART No.	NOTES
	OHMS	WATT		
R4	1meg		RC-102	
R5	33K		RC-100	
R6	220K		RC-201	
R7	330Ω		RC-104	
R8	2700Ω		RC-208	
R9	39K		RC-203	
R10	6.8meg		RC-103	
R11	220K		RC-201	
R12	220K		RC-201	
R13	220K		RC-201	
R14	100Ω	1	RC-401	
R15	220K		RC-201	
R16	3300Ω		RC-101	
R17	2200Ω	1	RC-402	
R18	47Ω	2	RC-600	
R19	47Ω	2	RC-600	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (cont)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SYMPHONIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3900Ω CT	30Ω SEC. 1	TR-103 ①							① Used in Models 1255, 1262, 1298, 1261. ② Used in Model 1265. ③ Used in Model 1290
		6-8Ω SEC. 2								
	3500Ω CT	30Ω SEC.1	TR-119 ②							
		6-8Ω SEC.2								
	4200Ω CT	25Ω SEC. 1	TR-102 ③							
		3-4Ω SEC. 2								

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA SYMPHONIC PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	SP-804 ①	8A31PAZ3.4	① Used in Models 1255, 1261
SP2	8"	PM	3-4Ω	SP-804 ①	8A31PAZ3.4	② Two used in Model 1265
SP3	3½"	PM	10-12Ω	SP-405 ①	3A15T	③ Two used in Models 1262, 1298
	6"	PM		SP-609 ②		④ Used in Models 1262, 1290
	6"	PM	3-4Ω	SP-600 ③④	6A21	
	4"	PM		SP-400 ④		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SYMPHONIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.072A	SR-100	1235AH	T150 SD-94 ①	150 K200 ①	① Silicon Type.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SYMPHONIC PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M2		55-T or 81-TB	GD-J			Models 1255, 1261, 1262, 1265
		81-T				Model 1290
		312-2	N8-2			Model 1298

·ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

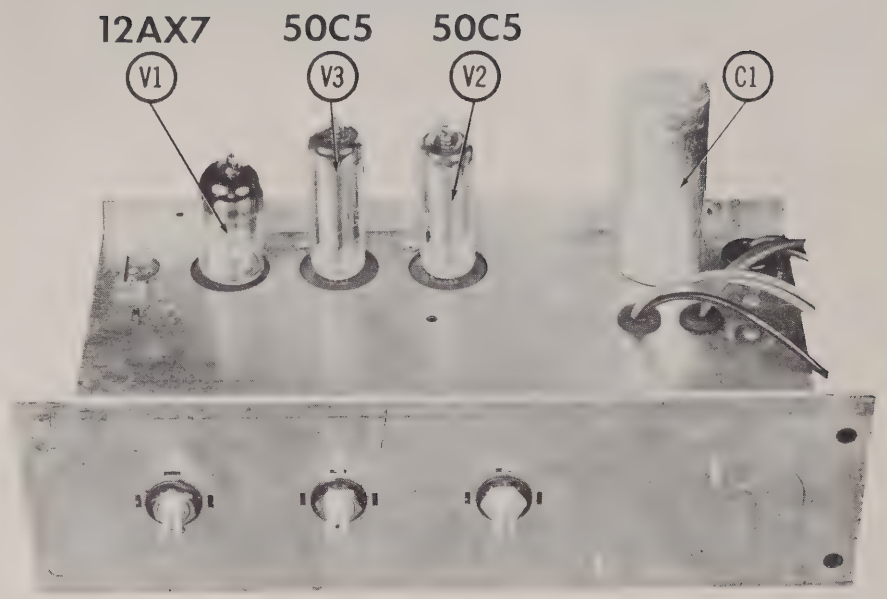
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA SYMPHONIC PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M3		†S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	Models 1255, 1261, 1262, 1265
		†CRA-552 or ♦CRA-552D	†W-64AGS or ♦W-64AGD	Model 1290

† Jewel ♦ Diamond

CHASSIS—TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	SYMPHONIC PART No.	NOTES
M4	Switch	SW-114	Speaker Selector, 3 Position, Rotary, Wafer Type, Models 1255, 1261

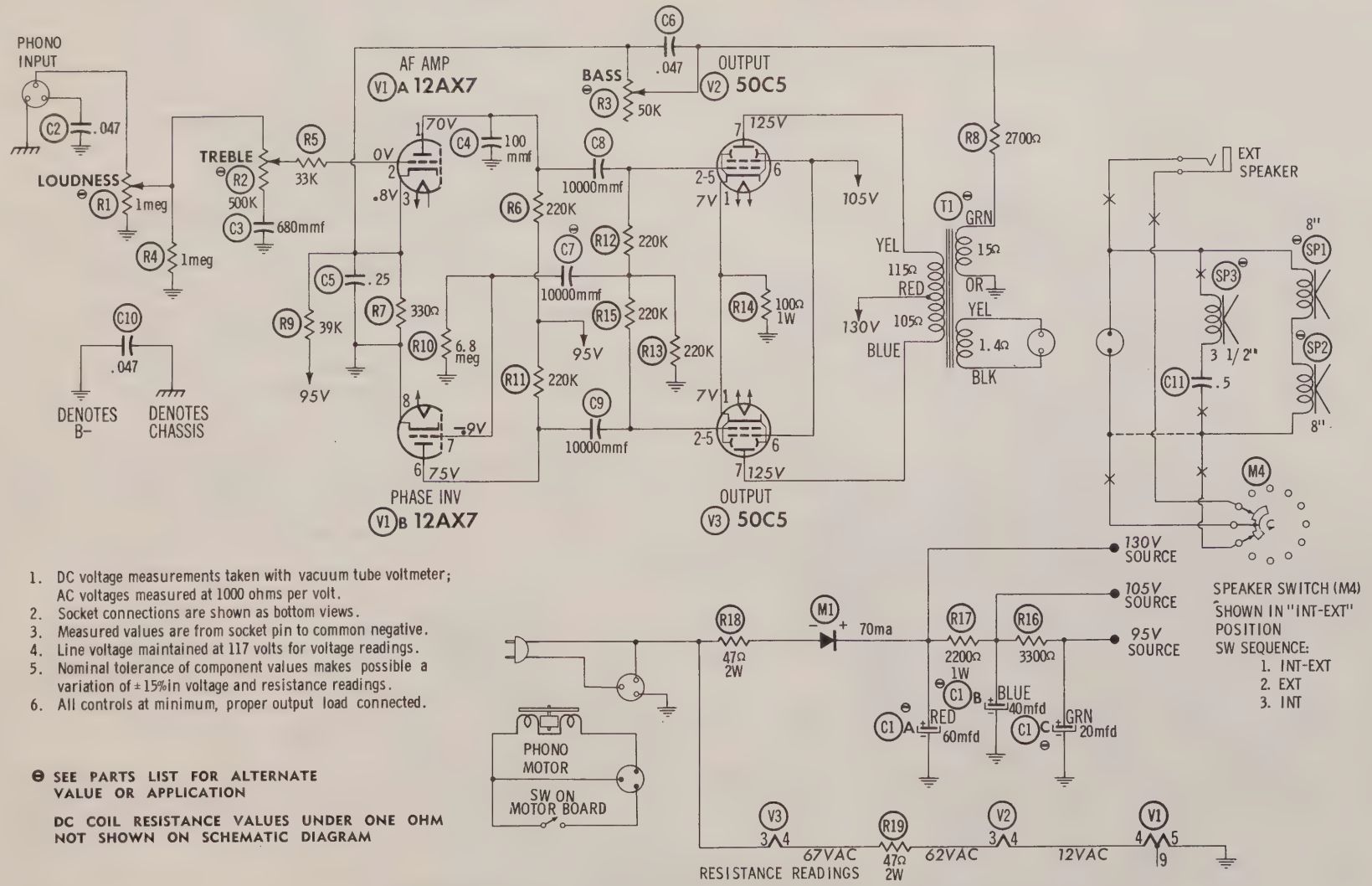
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KN-191	4 Used, Model 1255
Knob	KN-150	3 Used, Model 1261
Knob	KN-157	3 Used, Model 1298
Knob	KN-159	3 Used, Model 1262
Knob	KN-100	3 Used, Mahogany with gold, Model 1290
Knob	KN-105	3 Used, Grey with Gold, Model 1290

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†225K	500K	330Ω	12Ω	0Ω	†225K	6.8meg	0Ω	6Ω
V2	50C5	100Ω	440K	160Ω	109Ω	440K	†2200Ω	†115Ω		
V3	50C5	100Ω	440K	62Ω	12Ω	440K	†2200Ω	†105Ω		

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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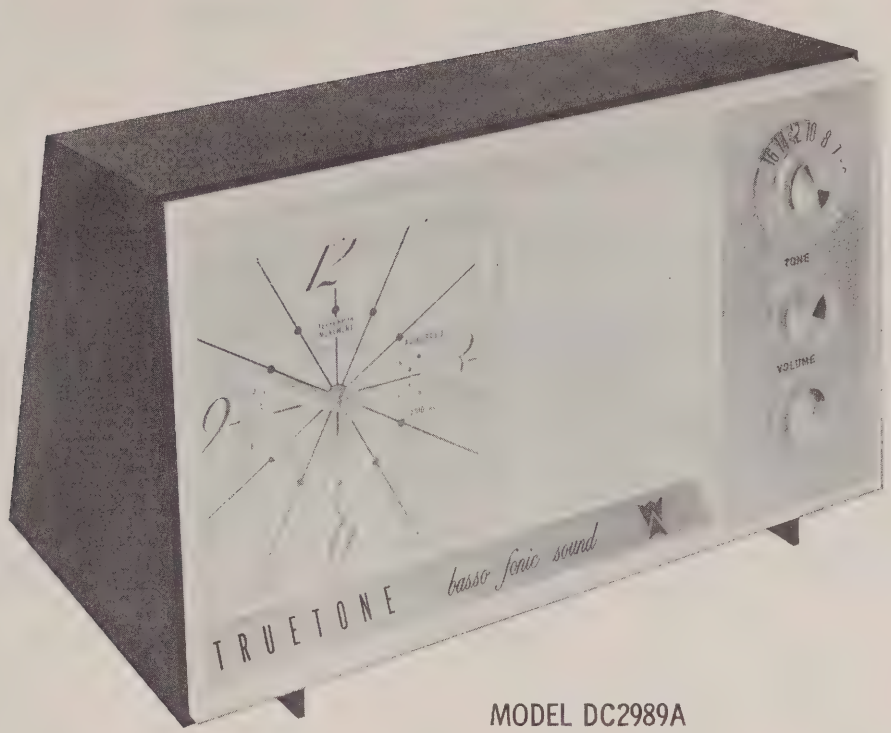
SYMPHONIC MODELS 1255, 1261, 1262, 1265, 1290, 1298

PHOTOFACT* Folder

TRUETONE MODELS
DC2988A, DC2989A



MODEL DC2989A

TRUETONE MODELS
DC2988A, DC2989A

TRADE NAME	Truetone Models DC2988A, DC2989A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.
TYPE SET	AC Operated 6 Tube AM Receiver (Model DC2989A is Clock Version)
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	28 Watts, .30 Amp. @ 117 Volts AC (Less Clock)
TUNING RANGE—BROADCAST	540 - 1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available, If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4.....GENERAL CEMENT #8729, 8989, 8728, 8988, 8987, 8275, 8195
WALSCO #2521, 2532

A5, A6, A7.....GENERAL CEMENT #5000, 5003, 5004, 5008, 5009, 5066, 8195, 8277, 8290, 8607, 8821, 9105, 9106, 9291
WALSCO #2515, 2520, 2522, 2523, 2534, 2537, 2538

A8.....GENERAL CEMENT #8606, 8606L, 9295
WALSCO #2543, 2544

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	456KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001mfd to reduce hum modulation.
2.	"	"	1650KC	"	"	A5	"
3.		Loop	1500KC	Tune to 1500KC signal	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal	"	A8	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 441 FOLDER 19

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12BA6	

ITEM No.	USE	TYPE	NOTES
V4	Det. -AVC-AF Amp.	12AV6	
V5	Output	35C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	150	150-142	PRS150V8040	BBRD0183.7		TDLD-14	FMT-1550	R1507 *
B	50	150							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	200			1468-0002	DD-201	5W5T2	MC237	1FM-32	①
C3	.05	200	152-104	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C4	.022	400	152-102	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C5	.1	200	152-122	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C6	200			1468-0002	DD-201	5W5T2	MC237	1FM-32	①
C7	.022	400	152-102	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C8	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	②
C9	10000		158-102	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C10	.1	200	152-122	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C11	.05	400	152-109	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C12	.05	400	152-109	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C13	.05	400	152-109	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

① Some versions may use 220mmf in this application (Part #156-111).
② Some versions may use .022mfd 400V in this application (Part #152-102).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4meg	½	120-141 ①					Volume, Tap@2.5meg
B	Shaft							
R2A	100K	½	120-138	B-41	A47-100K-Z	Q13-128	U39	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

① Part #120-137 (With switch) used in Model DC2988A.

RESISTORS

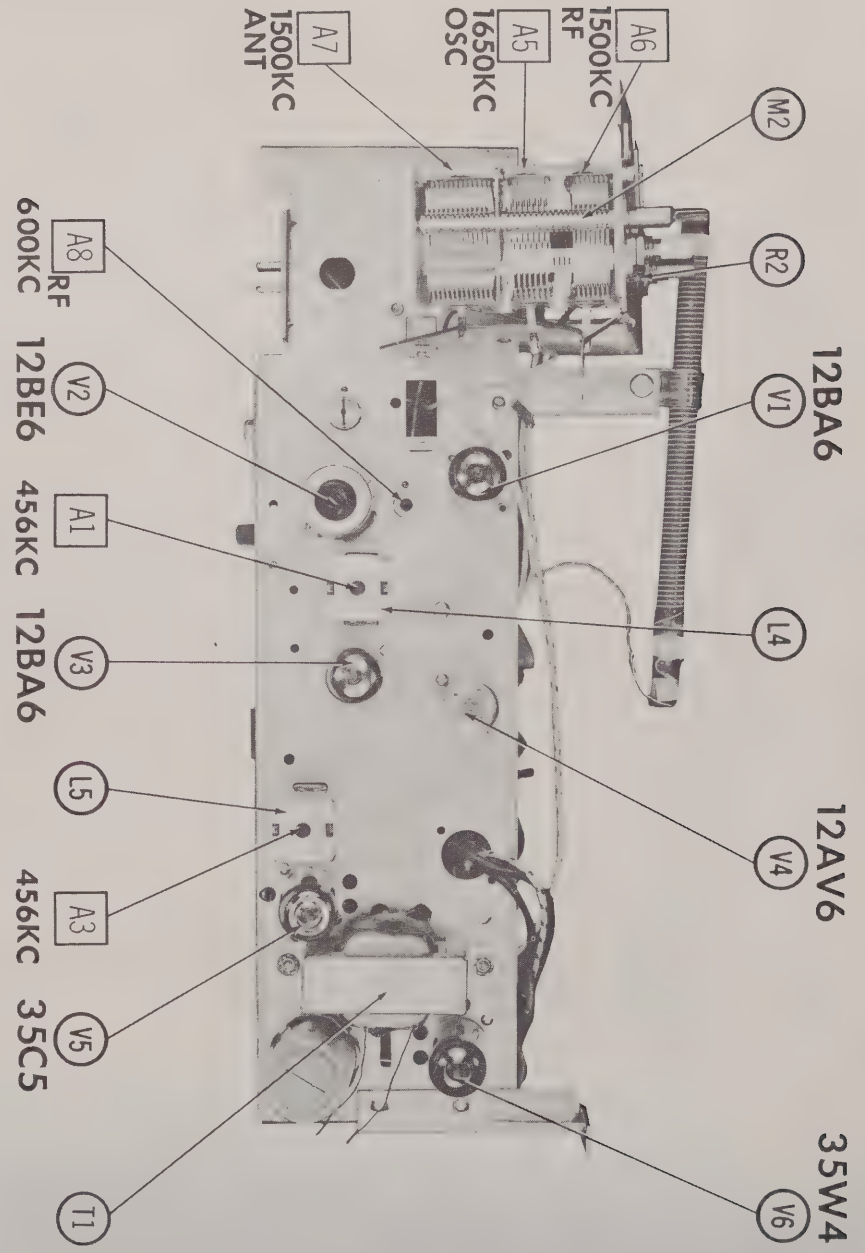
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R3	2.2meg		150-107	
R4	10K		180-190	
R5	330Ω		180-117	
R6	22K		180-102	
R7	220Ω		180-148	
R8	330K		180-109	
R9	2.2meg		180-107	
R10	680Ω		180-140	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R11	6.8meg		180-135	
R12	470K		180-110	
R13	1800Ω		180-159	
R14	15K		180-115	
R15	470K		180-110	
R16	150Ω		180-111	
R17	1000Ω	1	180-184	
R18	82Ω			Note 1.

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TRUETONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	132-140					
L2	RF Coil	132-139					Includes R4.
L3	Osc. Coil	136-141	14-1073				Includes R6.
L4	Input IF	130-114	16-6758	BC-352	12-C1	RF-1	
L5	Output IF	130-114	16-6758	BC-353	12-C2	RF-2	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC. 1	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2650Ω Tap ⓐ 200Ω	3-4Ω	138-131							
		SEC 2 62Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	175-140 ①	46AT	① Used in Model DC2989A
	6½"	PM	3-4Ω	175-139 ②		② Used in Model DC2988A

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	100mmf, 100mmf, 47K	166-107	Aerovox	PA-97-1
				Centralab	PC-50
				Cornell-Dubilier	111TM1
				Sprague	D-1

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Lamp	140-116	#47
M2	Tuning Cap.	160-130	3 Gang, Ant. 18-373mmf, RF. 7-187mmf, Osc. 6-90mmf
M3	Switch	125-111	Radio-Phono, SPST, Slide Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

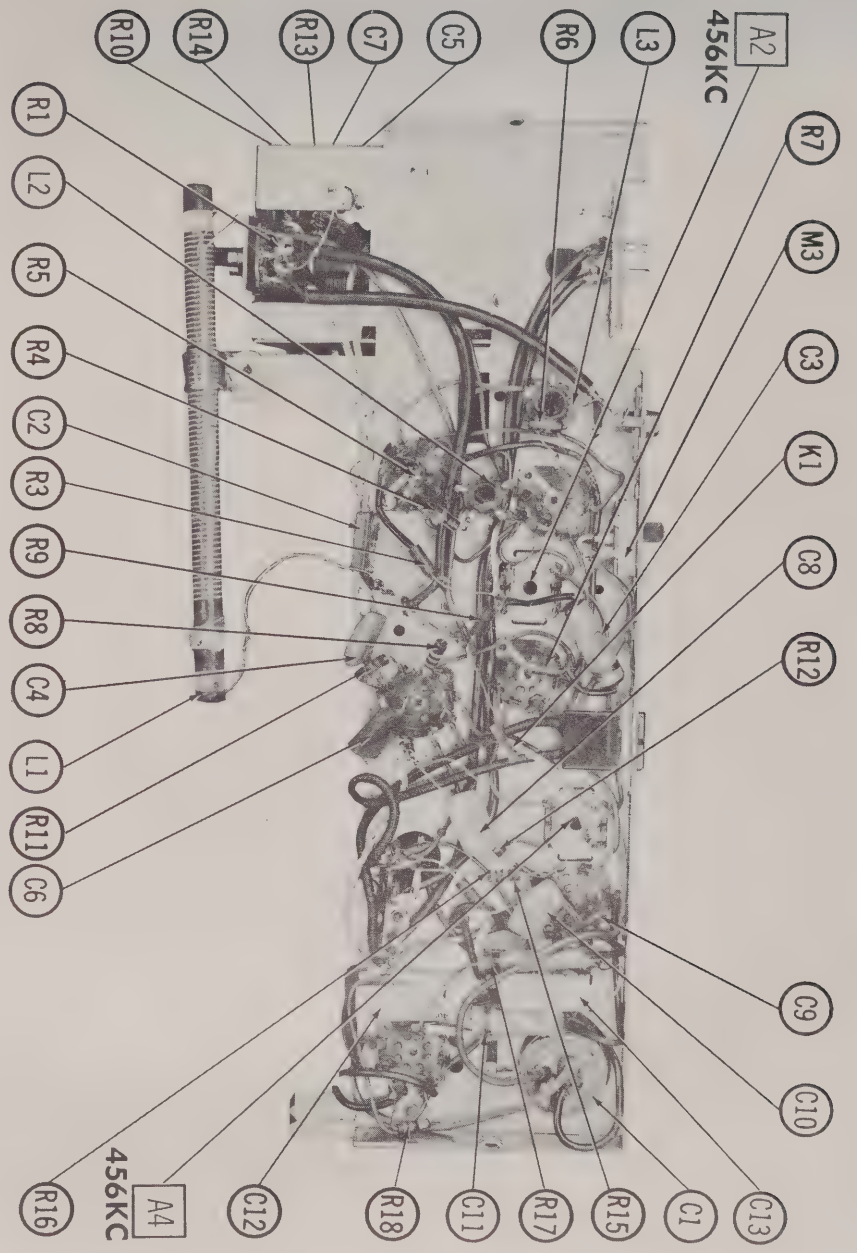
NAME	PART NO.	DESCRIPTION
Knob	220-160	Tuning
Knob	220-158	Volume, Tone
Disc	220-159	Calibration
Bar	215-165	Indicator
Cabinet	210-154	Model DC2989A
Cabinet	210-155	Model DC2988A
Panel Insert	205-127	Clock
Panel Insert	205-126	Model DC2988A
Crystal	205-129	Clock Insert
Crystal	205-130	Control Panel Insert

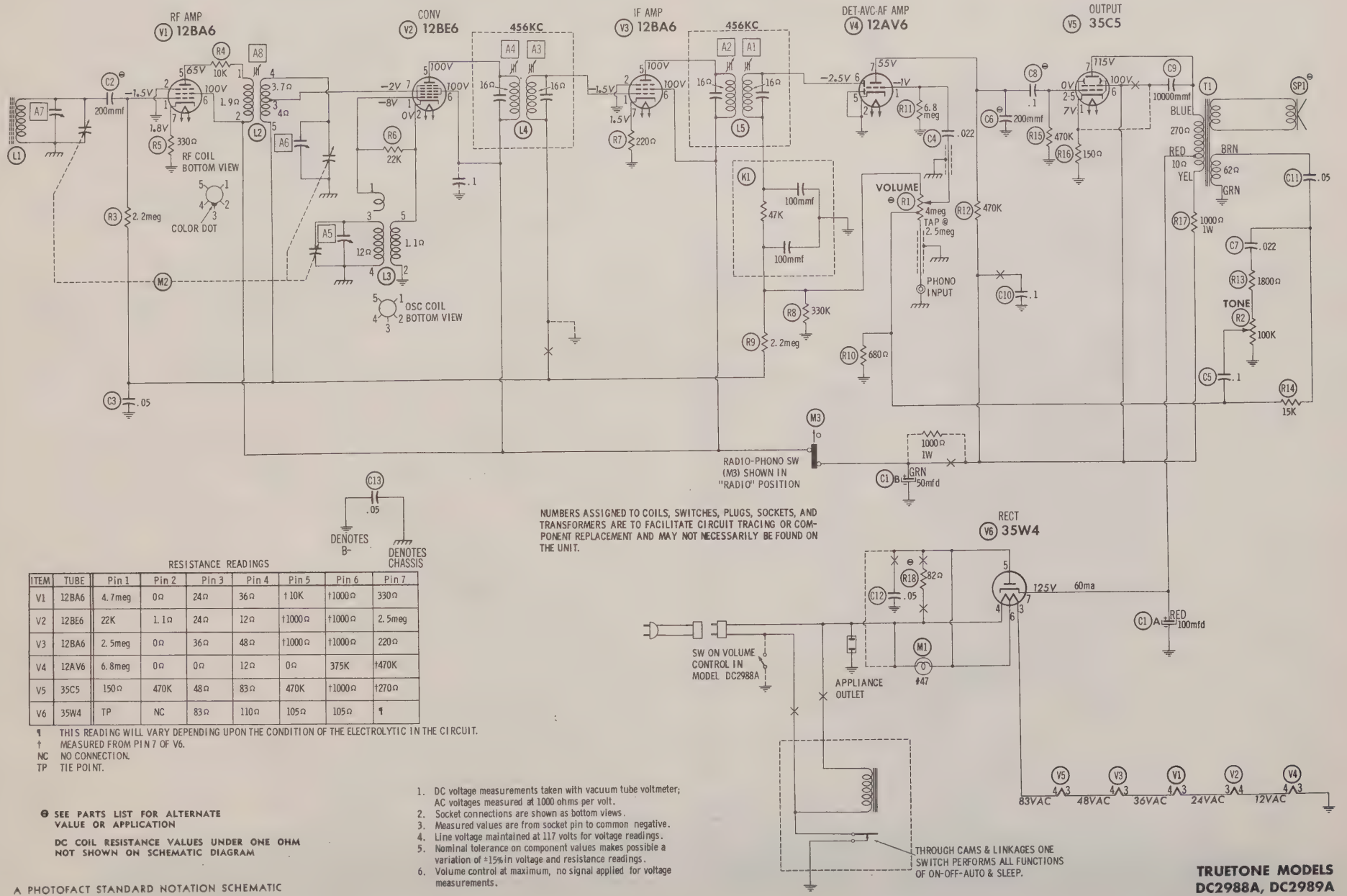
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—BOTTOM VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	4.7meg	0Ω	24Ω	36Ω	†10K	†1000Ω	330Ω
V2	12BE6	22K	1.1Ω	24Ω	12Ω	†1000Ω	†1000Ω	2.5meg
V3	12BA6	2.5meg	0Ω	36Ω	48Ω	†1000Ω	†1000Ω	220Ω
V4	12AV6	6.8meg	0Ω	0Ω	12Ω	0Ω	375K	†470K
V5	35C5	150Ω	470K	48Ω	83Ω	470K	†1000Ω	†270Ω
V6	35W4	TP	NC	83Ω	110Ω	105Ω	105Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION.
TP TIE POINT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TRUETONE MODELS DC2988A, DC2989A

PHOTOFACT* Folder with CIRCUITRACE*

ZENITH MODEL
Royal 700L (Ch. 7AT43Z1)

ZENITH MODEL
Royal 700L (Ch. 7AT43Z1)

ZENITH MODEL
Royal 700L (Ch. 7AT43Z1)

TRADE NAME	Zenith Model Royal 700L (CH. 7AT43Z1) (Blue Chassis Color Dot)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
RATING	9.5MA@9 Volts DC
TUNING RANGE—BROADCAST	540 - 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, thru A6..... GENERAL CEMENT #5000, 5003, 5004, 5008, 5009, 8276, 8290
WALSCO #2515, 2520, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	600KC	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	Tuning gang fully open	"	A4	"
3.		"	535KC	Tuning gang fully closed	"	A5	"
4.		"	1260KC	Tune to 1260KC signal	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H917

SET 441 FOLDER 20

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR PART NO.	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	121-54	Mixer (2N252)			2N486		PNP
X2	121-53	Osc.			2N485		PNP
X3	121-50	1st IF Amp (2N253)					NPN
X4	121-51	2nd IF Amp (2N254)					NPN
X5	121-52	Driver			2N362		PNP
X6	121-19	Output			2N632		PNP Note 1
X7	121-19	Output			2N632		PNP Note 1

Note 1. X6 & X7 are a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	10	22-3023	PWE10100	NL100-10	TT15X100	ML100-15	TE-1119, 3	
C2	100	10	22-3023	PWE10100	NL100-10	TT15X100	ML100-15	TE-1119, 3	
C3	3	12	22-2884	XPP-12003	NL3-6	TT12X2	ML2-15	TE-1122	
C4	10	6		PWE6010	NL10-6	TT6X10	ML10-6	TE-1087	①
C5	50	12	22-2883	XPP-12050	NL50-10	TT15X50	ML50-15	TE-1133	

① Some versions may use 3mfd@12V (Part #22-2884).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	20000			22-2885	BPD-02	DA-203	BYB6S2	TA-120	5HK-S2	
C7	50000			22-2728	BPD-05	DA-503		TA-150	TG-S50	
C8	1000			22-2729	BPD-001	DD-102	BYA6D1	B-210	5HK-D1	
C9	50000			22-2728	BPD-05	DA-503		TA-150	TG-S50	
C10	50000			22-2728	BPD-05	DA-503		TA-150	TG-S50	
C11	20000			22-2885	BPD-02	DA-203	BYB6S2	TA-120	5HK-S2	
C12	50000			22-2728	BPD-05	DA-503		TA-150	TG-S50	
C13	20000			22-2885	BPD-02	DA-203	BYB6S2	TA-120	5HK-S2	
C14	50000			22-2728	BPD-05	DA-503		TA-150	TG-S50	
C15	20000			22-2885	BPD-02	DA-203	BYB6S2	TA-120	5HK-S2	
C16	220			22-3017	BPD-00022	DD-221	L10T22	B-322	5GA-T22	
C17	1000	1000		22-17	HVD-151000	DD-102	BYA10D1M	B-210	5GA-D1	
C18	1000	1000		22-17	HVD-151000	DD-102	BYA10D1M	B-210	5GA-D1	
C19	20000			22-2885	BPD-02	DA-203	BYB6S2	B-210	5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	63-4035 ①					Volume & Switch

① Part #63-4094 may be used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R2	1000Ω		63-1786	
R3	1500Ω		63-1793	
R4	180K		63-1880	
R5	1500Ω		63-1792	
R6	4700Ω		63-1813	
R7	10K		63-1827	
R8	2200Ω		63-1800	
R9	1000Ω		63-1786	
R10	68K		63-1863	
R11	1000Ω		63-1786	
R12	27K		63-1845	
R13	3300Ω		63-1806	

ITEM No.	RATING		ZENITH PART No.	NOTES
	OHMS	WATT		
R14	1000Ω		63-1786	
R15	10K		63-1827	
R16	4700Ω		63-1813	
R17	47K		63-1855	
R18	22Ω		63-1715	
R19	3300Ω		63-1806	
R20	680Ω		63-1778	
R21	820Ω		63-1782	
R22			63-3663	Note 1
R23	5600Ω		63-1817	
R24	4.7	1	63-3665	
R25	100Ω		63-1744	

Note 1. Temperature Compensating Unit.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ZENITH PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	S-43632					
L2	Osc. Coil	95-1513					
L3	1st IF Trans.	95-1514					
L4	2nd IF Trans.	95-1515					
L5	3rd IF Trans.	95-1576					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2	: 1	95-1587	GH 118			TR-7		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-839	4A07	

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	Z-7 ①		1 ①		935 ①		M-14R①	① 6 Used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N60	103-19	1N60	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap. Earphone	22-3013 39-22	2 Gang, Ant. 15-170mmf, Osc. 11-104mmf (Impedance 15Ω@ 1000Ω)

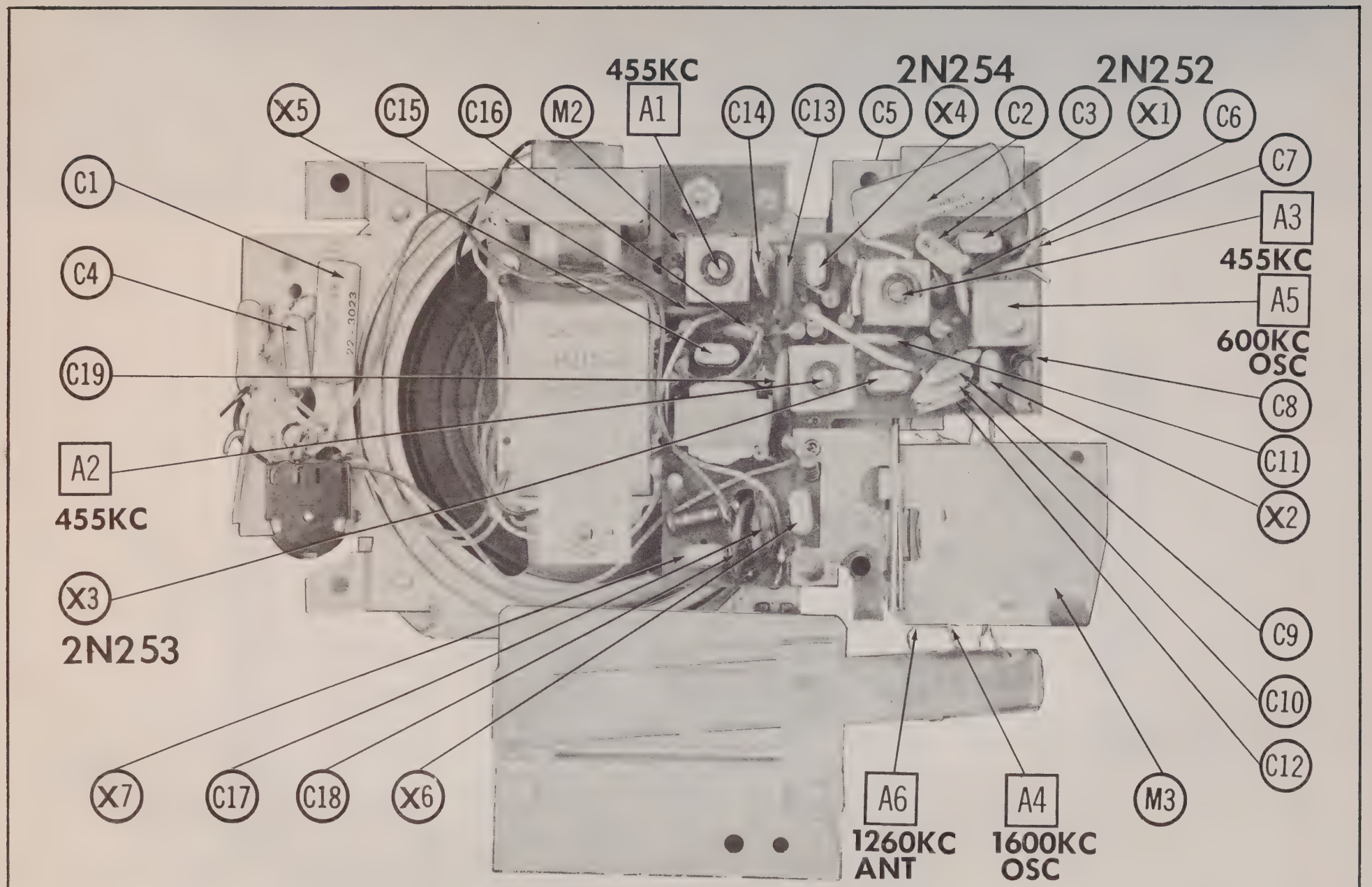
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

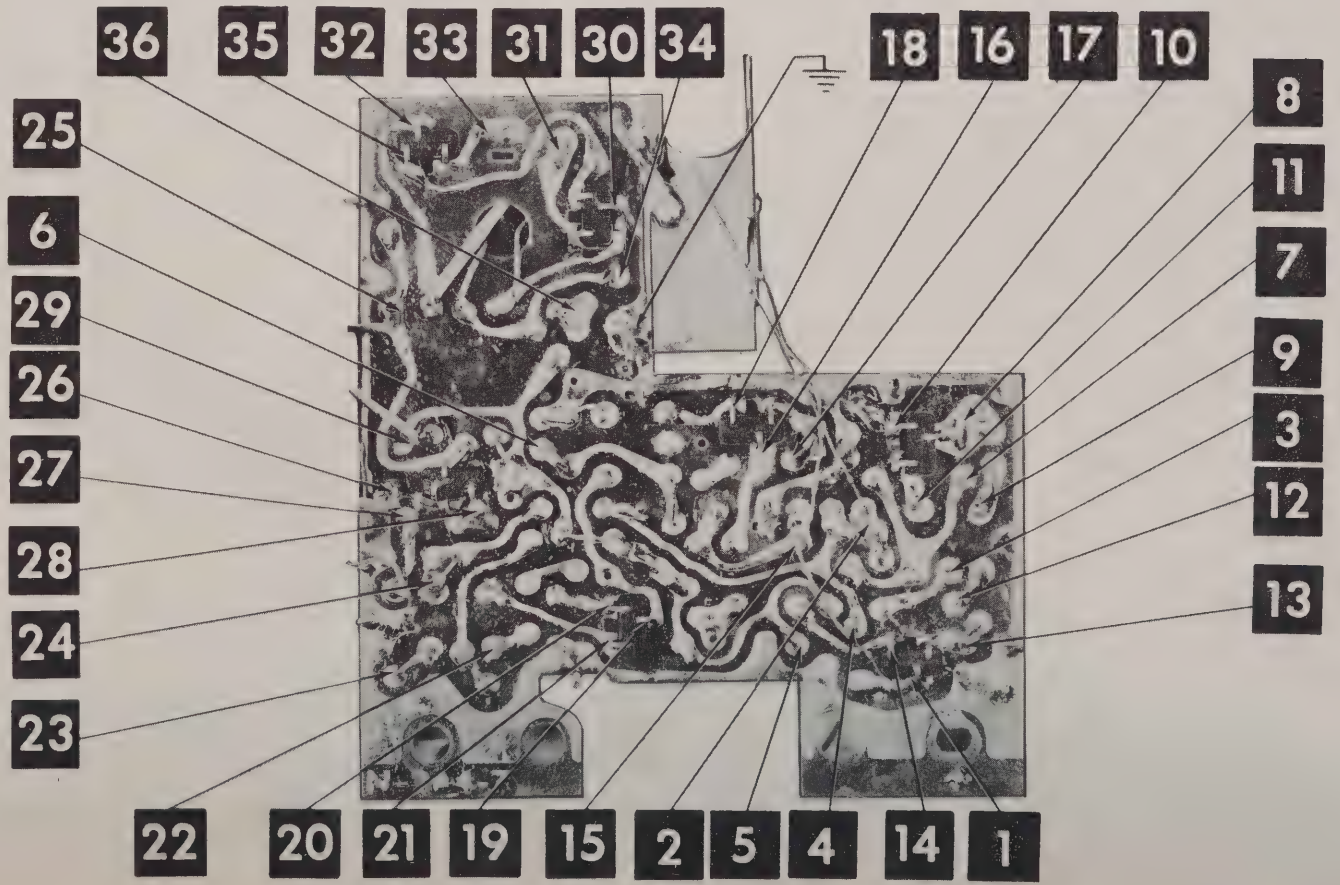
NAME	PART NO.	DESCRIPTION
Knob Dial Knob Knob Cabinet	46-1671 S-42733 46-1673 14-2327	Tuning Includes Ring Assembly Volume-On-Off

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS TOP VIEW - TRANSISTOR, CAPACITOR, MISC. & ALIGN. IDENT.



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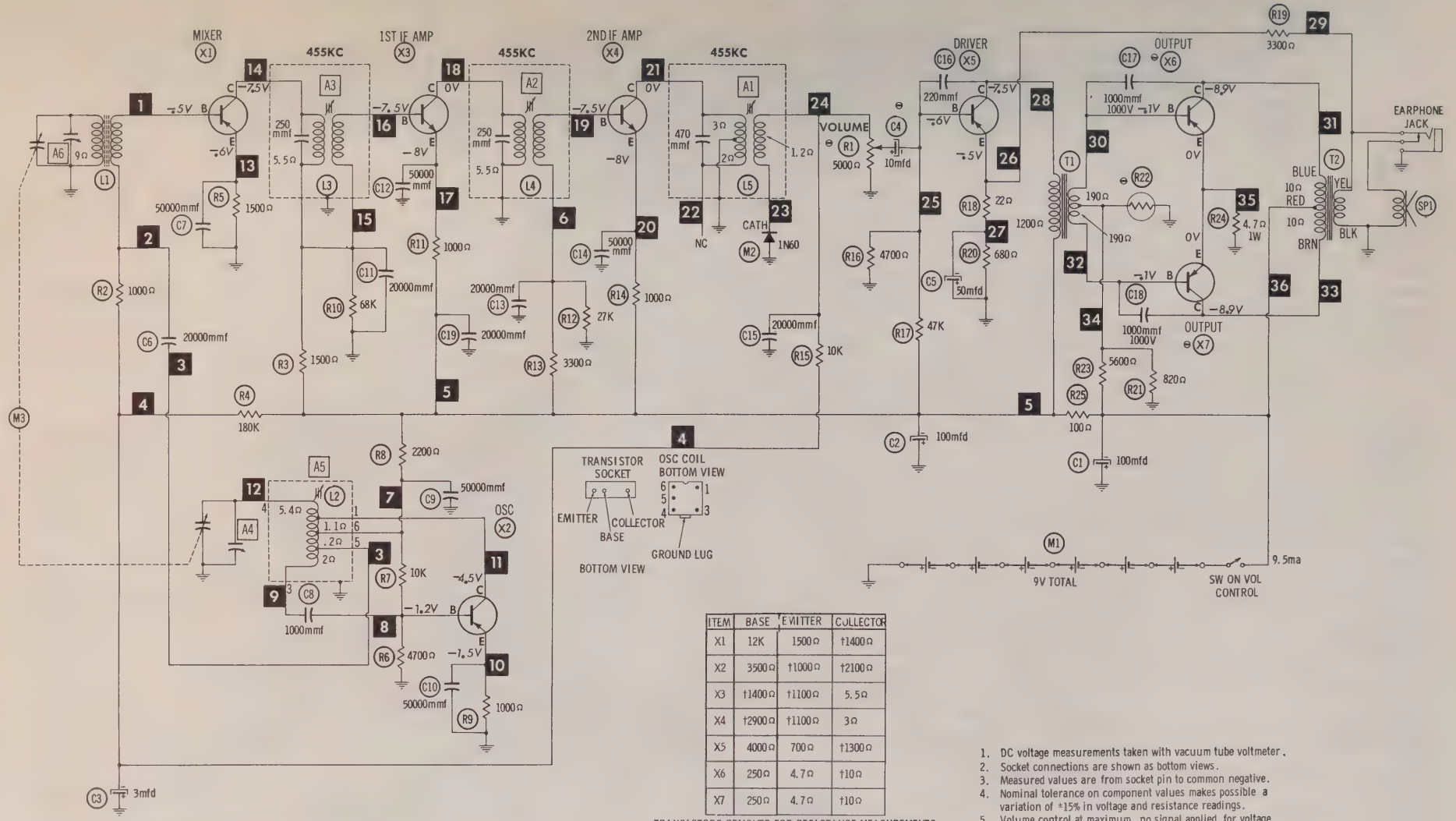

ITEM	BASE	EMITTER	COLLECTOR
X1	12K	1500Ω	†1400Ω
X2	3500Ω	†1000Ω	†2100Ω
X3	†1400Ω	†1100Ω	5.5Ω
X4	†2900Ω	†1100Ω	3Ω
X5	4000Ω	700Ω	†1300Ω
X6	250Ω	4.7Ω	†10Ω
X7	250Ω	4.7Ω	†10Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R23 AND R25.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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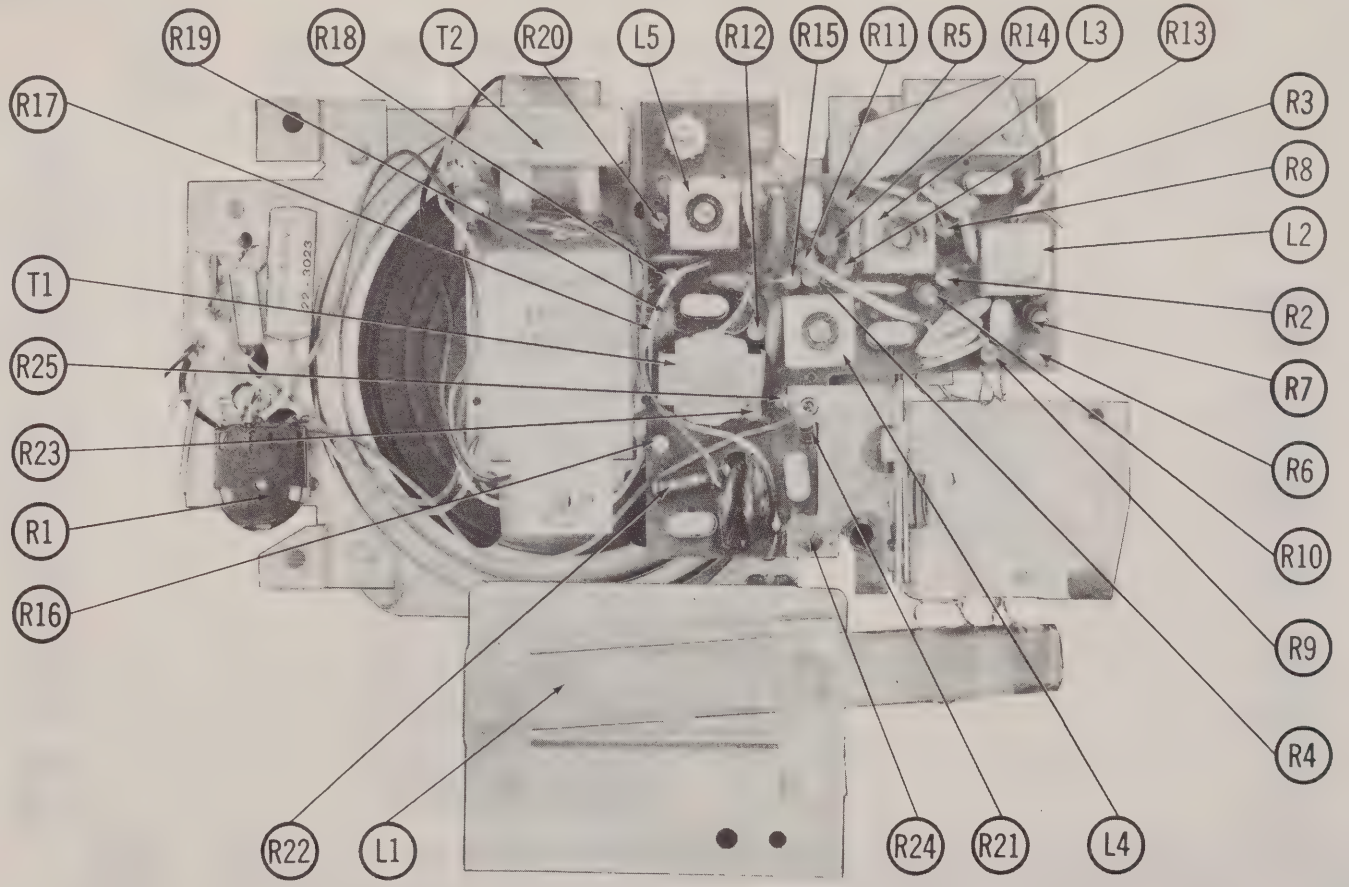
ZENITH MODEL
Royal 700L (Ch. 7AT43Z1)

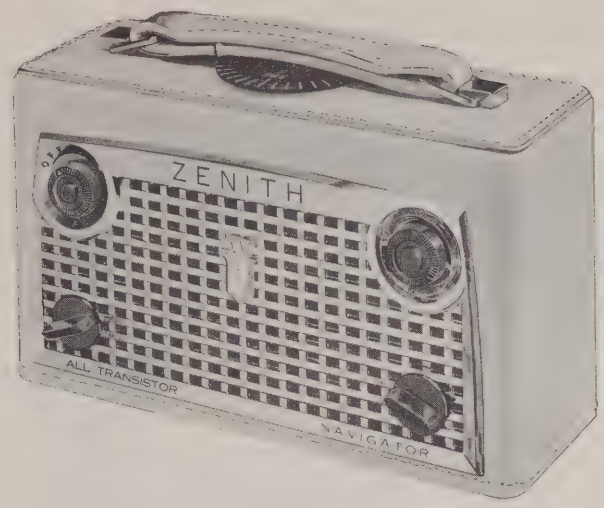


CHASSIS TOP VIEW RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

ZENITH MODEL Royal 760 (Ch. 8AT42Z2)

ZENITH MODEL Royal
760 (Ch. 8AT42Z2)



TRADE NAME	Zenith Model Royal 760 (CH. 8AT42Z2)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC
RATING	7.5MA @ 9 Volts DC (No Signal, Min. Volume) 8.5MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3, A10, A12 and A13.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A4, A6, A9 and A11.....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A7 and A8.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

Alignment must be made with Nor-Nav switch in Nor. position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop (To BC loopstick)	455KC (400∿ Mod.)	BC	1600KC	Across speaker voice coil.	A1, A2, A3	Fashion loop of one turn of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	600KC	"	600KC	"	A4	Adjust for maximum output while rocking gang.
3.		"	1600KC	"	1600KC	"	A5	Adjust for maximum output. Repeat steps 2 & 3.
4.		"	600KC	"	600KC	"	A6	Adjust for maximum output while rocking gang.
5.		"	1400KC	"	1400KC	"	A7, A8	Adjust for maximum output. Repeat steps 4 & 5.
6.		Loop (To LW loopstick)	165KC	LW	165KC	"	A9	Adjust for maximum output while rocking gang.
7.		"	400KC	"	400KC	"	A10	Adjust for maximum output while rocking gang. Repeat steps 6 & 7.
8.		"	165KC	"	165KC	"	A11	Adjust for maximum output while rocking gang.
9.		"	370KC	"	370KC	"	A12, A13	Adjust for maximum output while rocking gang. Repeat steps 8 & 9.

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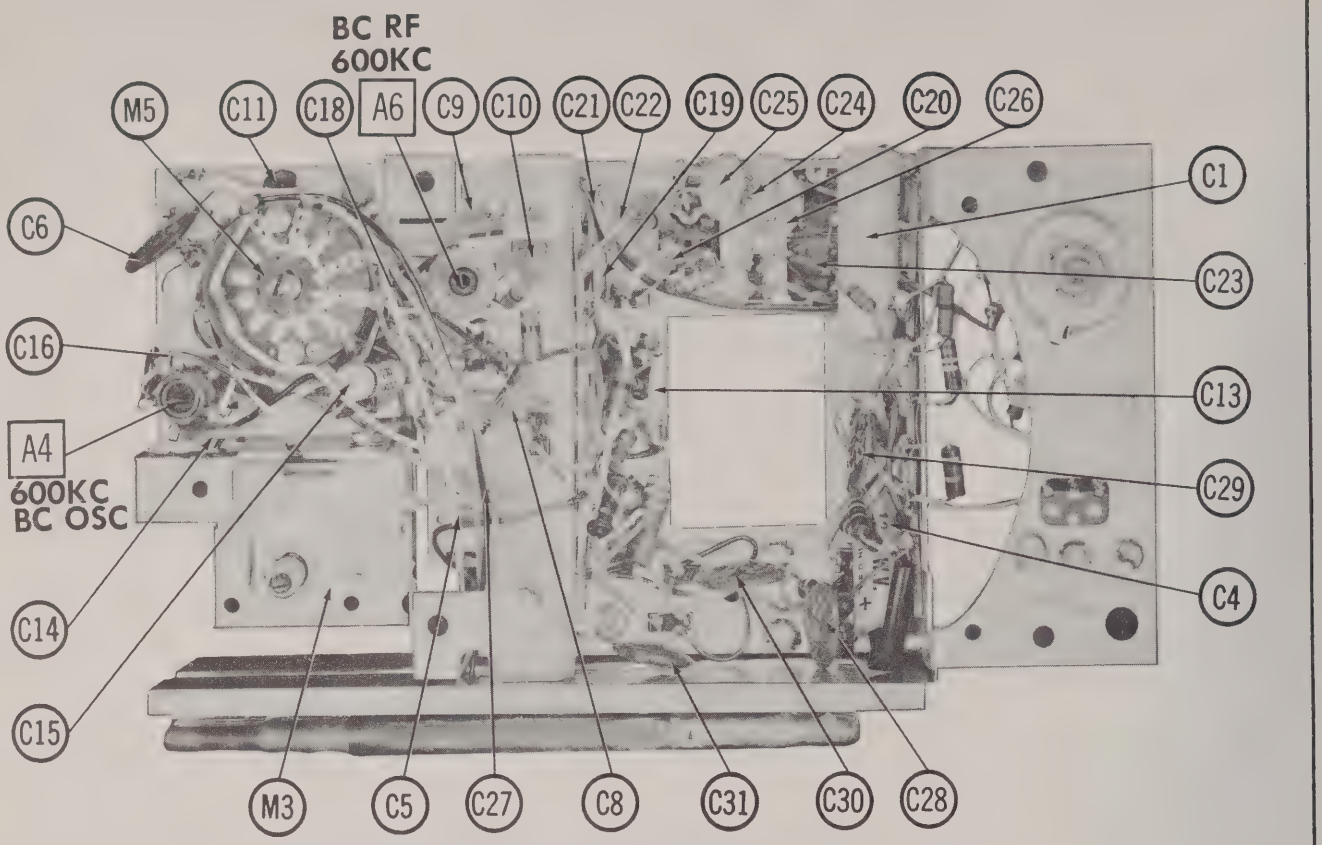
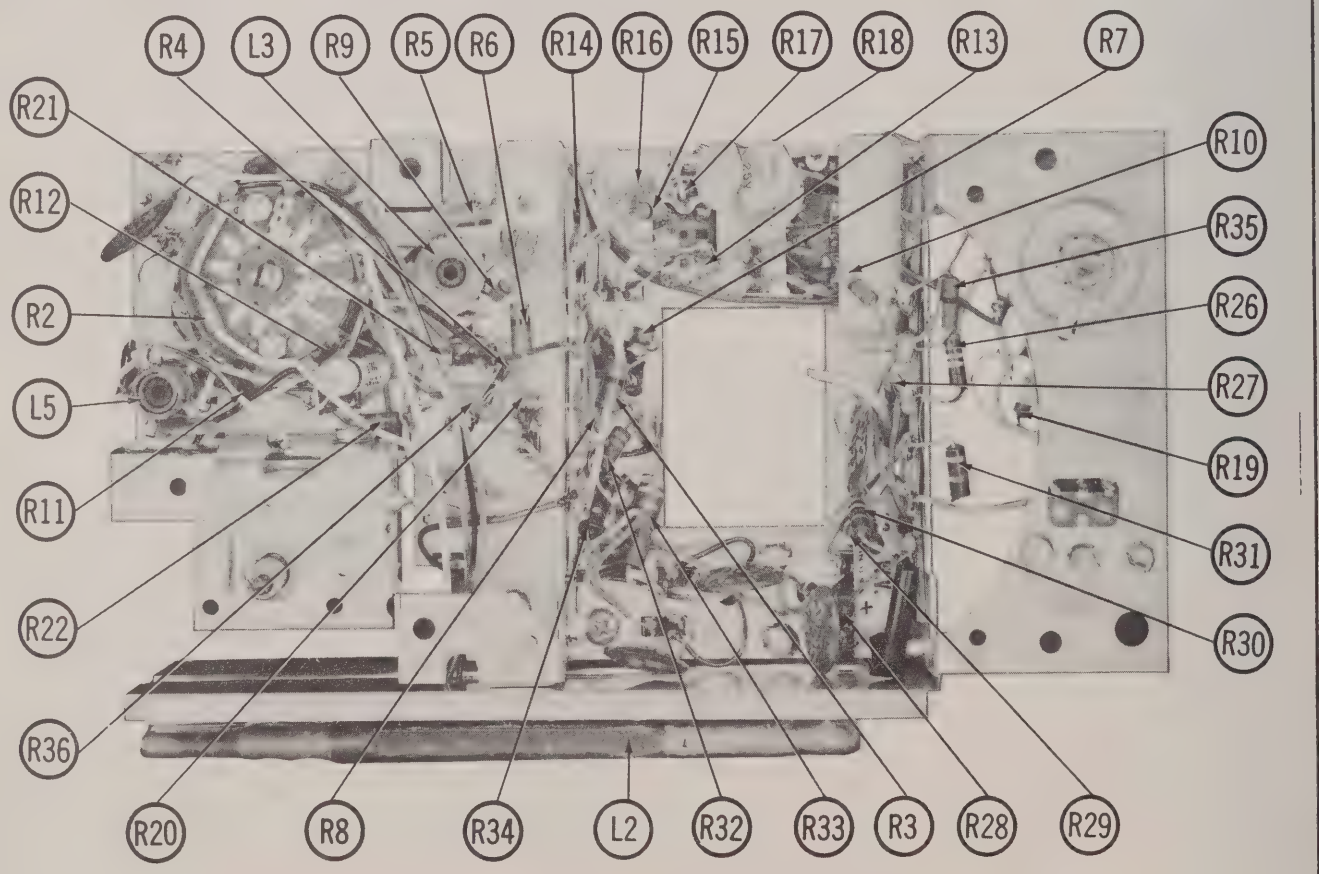
SET 441 FOLDER 21



CHASSIS BOTTOM VIEW - CAPACITOR, MISC & ALIGN IDENTIFICATION



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR. PART NO.	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	121-78	RF Amplifier		2N544		2N544	PNP
X2	121-62	Mixer		2N411	2N484	2N141	PNP
X3	121-65	Oscillator		2N409	2N482	2N409	PNP
X4	121-73	1st IF Amplifier		2N409	2N483	2N409	PNP
X5	121-74	2nd IF Amplifier		2N409	2N482	2N409	PNP
X6	121-64	Driver		2N407	2N362	2N407	PNP
X7	121-61	Output		2N407	2N360	2N407	PNP } Matched
X8	121-61	Output		2N407	2N360	2N407	PNP } Matched

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	100	10	22-3062	BCD10V8080					
B	100	10							
C2	16	3	22-2871	PWE3015	NL15-6	TT6X15	ML20-3	TE-1053.5	
C3	3	12	22-2884	XPP-12003	NL5-15	TT12X3	ML2-15	TE-1122	
C4	50	12	22-2883	SRE12V50	NL50-10	TT15X50	ML50-15	TE-1133	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

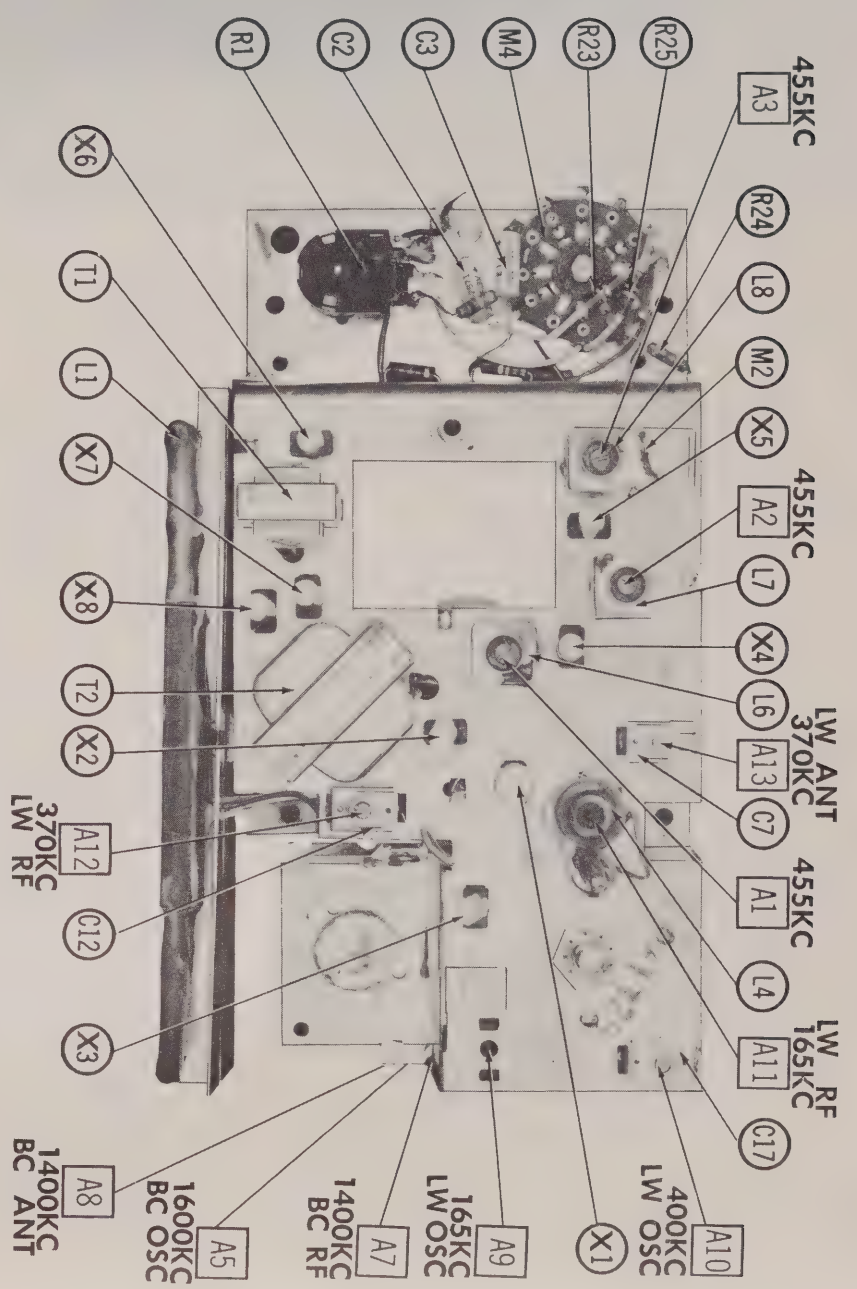
ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	50000			22-2728				TA-150		
C6	4700			22-14	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C7				22-3082						
C8	50000			22-2728				TA-150		
C9	50000			22-2728				TA-150		
C10	50000			22-2728				TA-150		
C11	10		N150	22-2731						
C12				22-3082						
C13	50000			22-2728				TA-150		
C14	50000			22-2728				TA-150		
C15	.1	50		22-2998	P285N-1	DF-104	CUB2P1	GEM-201	2WF-P10	
C16	120		2%	22-3097						
C17				22-3083						
C18	50000			22-2728				TA-150		
C19	50000			22-2728				TA-150		
C20	10		N150 5%	22-2731						
C21	50000			22-2728				TA-150		
C22	50000			22-2728				TA-150		
C23	6		NPO 5%	22-2381			C10V6C		5TCCB-V6S 5%*	
C24	50000			22-2728				TA-150		
C25	50000			22-2728				TA-150		
C26	50000			22-2728				TA-150		
C27	50000			22-2728				TA-150		
C28	1000		10%	22-17	DI 1000			JL-210	5GA-D1S 10%*	
C29	2200		10%	22-18	DI 2200			JL-222	5GA-D22S 10%*	
C30	1000		10%	22-17	DI 1000			JL-210	5GA-D1S 10%*	
C31	1000		10%	22-17	DI 1000			JL-210	5GA-D1S 10%*	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/2	63-4407					Volume & Switch

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R2	5600Ω		63-1817	
R3	1000Ω		63-1786	
R4	1500Ω		63-1792	
R5	3300Ω		63-1806	
R6	1000Ω		63-1786	
R7	100K		63-1869	
R8	1000Ω		63-1785	
R9	1000Ω		63-1785	
R10	560Ω		63-1775	
R11	10K		63-1827	
R12	4700Ω		63-1813	
R13	220K		63-1883	
R14	560Ω		63-1775	
R15	1000Ω		63-1785	
R16	33K		63-1848	
R17	3900Ω		63-1810	
R18	820Ω		63-1782	
R19	10K		63-1827	
R20	4700Ω		63-1813	
R21	330Ω		63-1764	
R22	680Ω		63-1778	
R23	150K		63-1876	
R24	4700Ω		63-1813	
R25	68K		63-1862	
R26	68K		63-1862	
R27	5600Ω		63-1817	
R28	22Ω		63-1715	
R29	680Ω		63-1778	
R30	3300Ω		63-1806	
R31	5600Ω		63-1817	
R32	820Ω		63-1782	
R33	4.7Ω 5%		63-4530	
R34	100Ω cold		63-3663	
R35	100Ω		63-1744	
R36	560Ω		63-1775	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ZENITH PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	BC Loopstick	S-43957					
L2	LW Loopstick	S-43956					
L3	BC RF Trans.	S-43961					
L4	LW RF Trans.	S-43963					
L5A	BC Osc. Trans.	S-43965					
B	LW Osc. Trans.						
L6	1st IF Trans.	95-1614	16-9003*				* Disregard Tap
L7	2nd IF Trans.	95-1615	16-9003				
L8	3rd IF Trans.	95-1616	16-9004				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3.5	: 1	95-1621	GH120		TA35	TR-13		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	600Ω CT	3-4Ω	95-1619						TY-45X①	① Drill mounting holes

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.6Ω	49-854	4A15	

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	9V	Z-7①		1①		935①		M-14①	① 6 Used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ZENITH PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N295	103-22①	1N60	1N295	Detector (Pigtail)

① Part of assembly Part #S-43923

MISCELLANEOUS

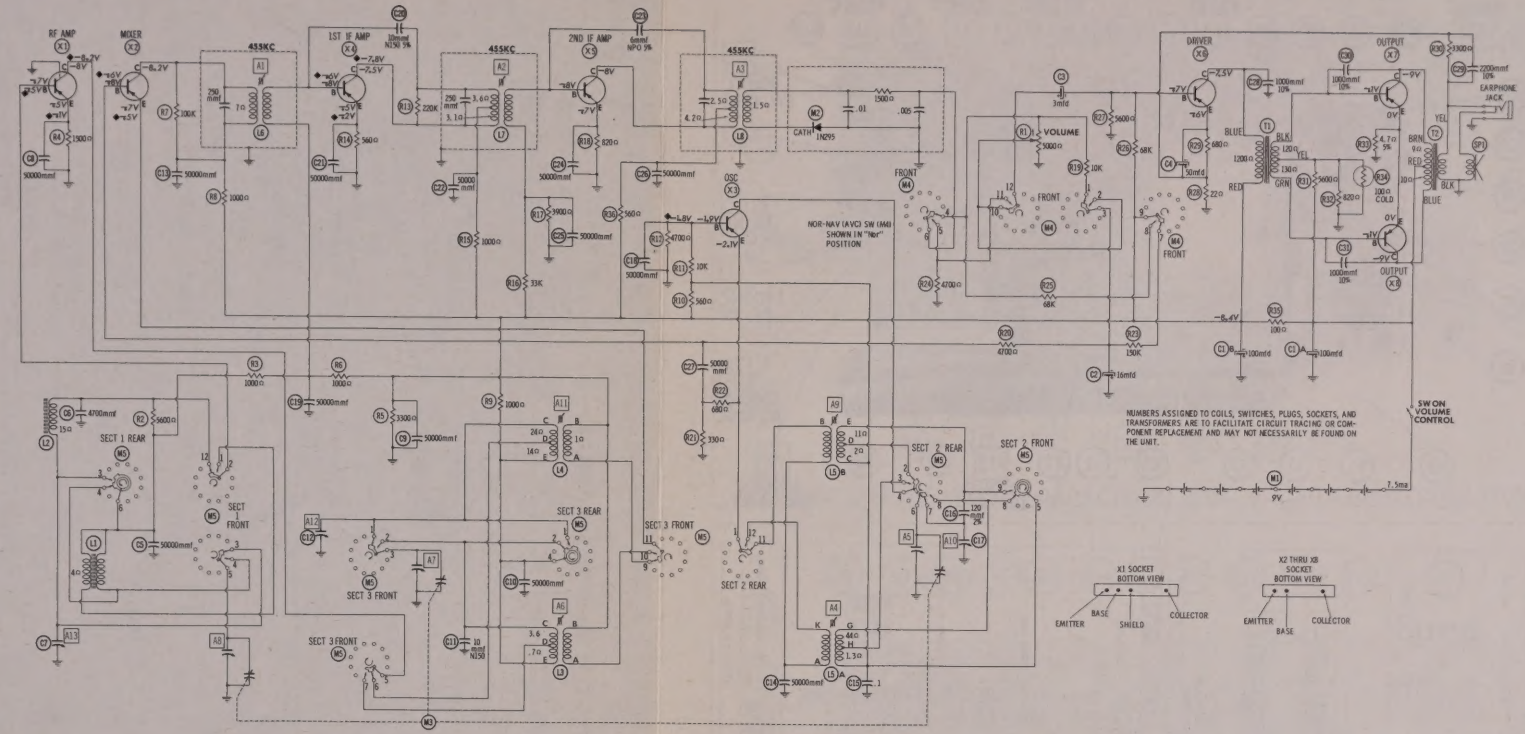
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap.	22-3084	3 Gang (Ant. 11-232mmf, RF. 22-374mmf, Osc. 12-115mmf)
M4	Switch	85-608	AVC (Rotary Wafer Type)
M5	Switch	85-609	Band (Rotary Wafer Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	121-78	5500Ω + 11K	1500Ω	†1100Ω
X2	121-62	20K	3300Ω	†1100Ω
X3	121-65	4300Ω	1000Ω	†660Ω
X4	121-73	4300Ω	560Ω	†1100Ω
X5	121-74	3900Ω	820Ω	†660Ω
X6	121-64	5600Ω	700Ω	†1300Ω
X7	121-61	220Ω	4.7Ω	†9Ω
X8	121-61	250Ω	4.7Ω	†10Ω

ALL MEASUREMENTS TAKEN IN "BROADCAST" POSITION UNLESS OTHERWISE DESIGNATED. TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
* MEASURED IN "LONG WAVE" POSITION.
† MEASURED FROM JUNCTION OF R31 AND R35.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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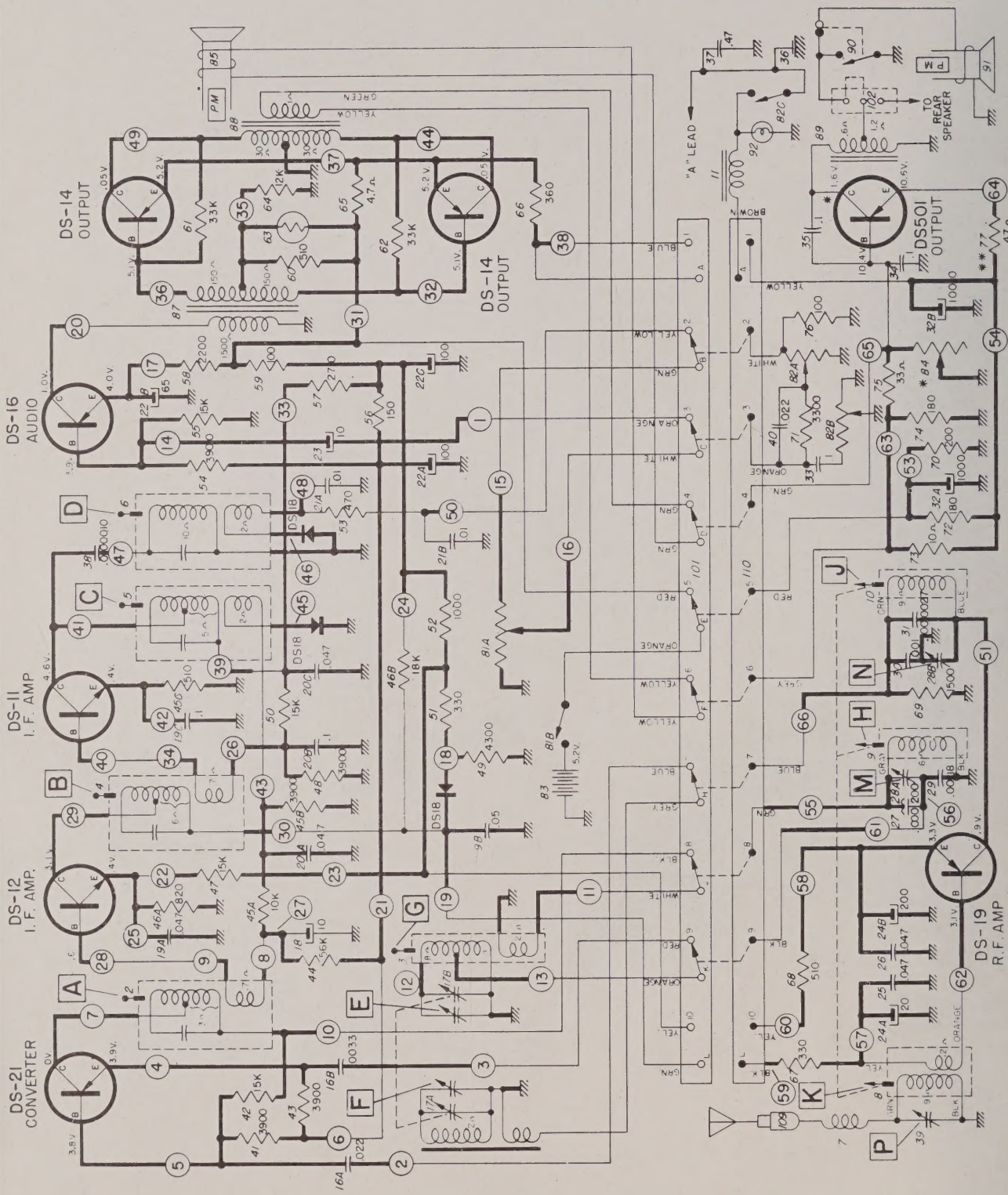
ZENITH MODEL Royal 760 (Ch. 8AT42Z2)

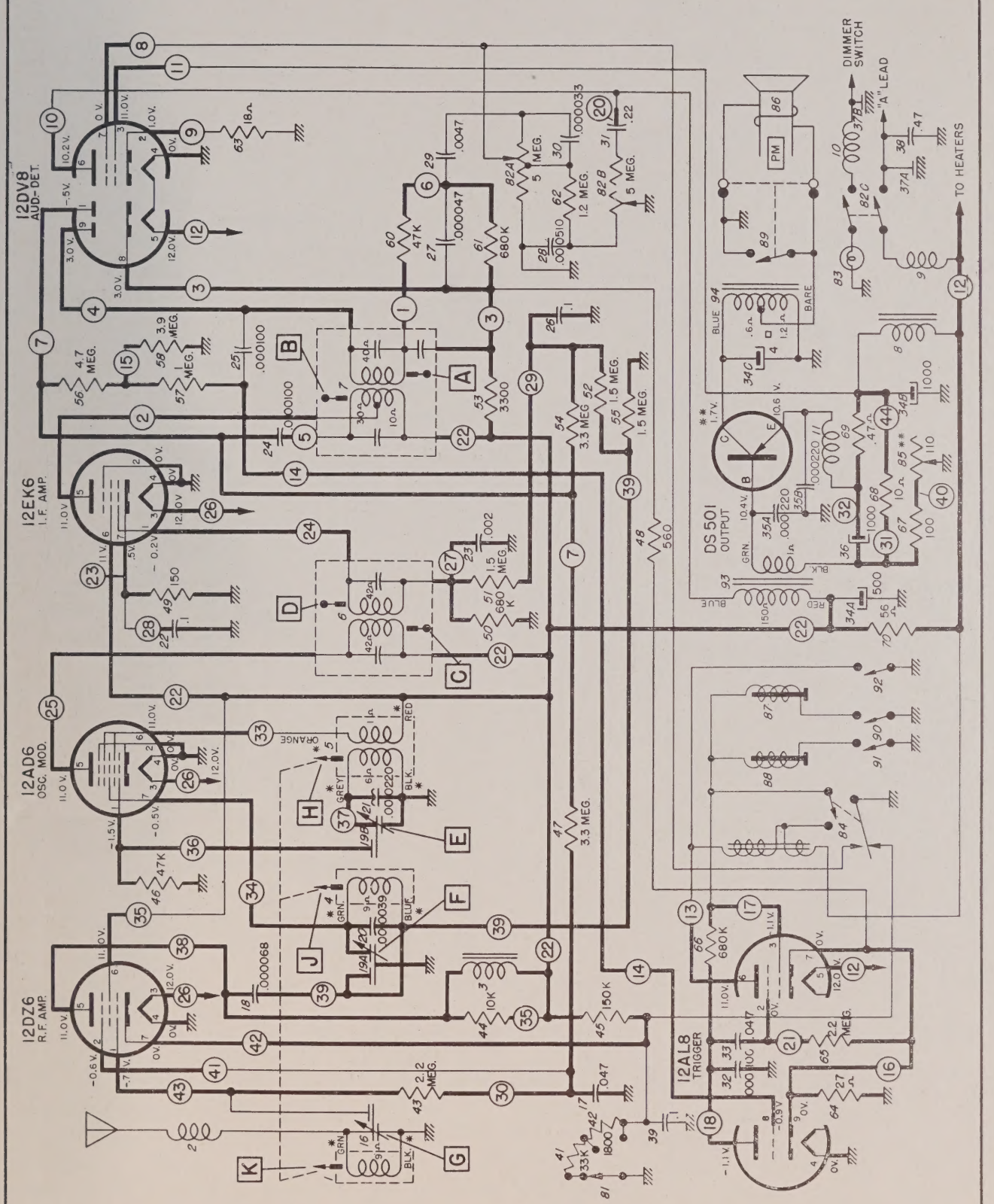
Printed circuit shown in heavy lines



Schematic Diagrams Courtesy of DELCO RADIO DIV OF GENERAL MOTORS CORP

OLDSMOBILE MODEL 989172

Printed circuit shown in heavy lines



CHEVROLET MODEL 987893

USE POWER LINE ISOLATION TRANSFORMER WHEN SERVICING THE CHASSIS.
PICTURE TUBE HIGH VOLTAGE ANODE LEAD MAY HAVE A POTENTIAL OF 16,000 VOLTS.
OBSERVE ALL HIGH VOLTAGE PRECAUTIONS WHEN SERVICING THE CHASSIS. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COVER REMOVED.

USE SAFETY GOGGLES AND GLOVES WHEN HANDLING THE PICTURE TUBE.

IMPORTANT

READ THESE INSTRUCTIONS CAREFULLY AND OBSERVE THE CONDITIONS NOTED WHEN TAKING VOLTAGE READINGS OR OBSERVING WAVEFORMS.

VOLTAGE MEASUREMENT CONDITIONS UNLESS OTHERWISE SPECIFIED:

1. Voltage measured to chassis using Sylvania Polymeter (VTVM).
2. AC power source 117V. 60 cycle line.
3. Voltage readings in brackets taken with no signal input; channel selector set to free channel. Antenna disconnected. Antenna terminals shorted together and grounded to chassis.
4. Voltage readings not in brackets taken with a strong signal input; tuner set to strong local station developing approximately -20V. on IF AGC bus (junction of R-203 & R-205).
5. Contrast control set to maximum. Brightness control set to minimum.
6. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.

SPECIAL VOLTAGE MEASUREMENT CONDITIONS:

◉ Picture tube anode voltage measured with VTVM high voltage probe at line voltage of 117V. under conditions of normal signal. No brightness and correct scan size.

▲ High peak voltage of short duration may damage meter used for this measurement.

WAVEFORM MEASUREMENT CONDITIONS:

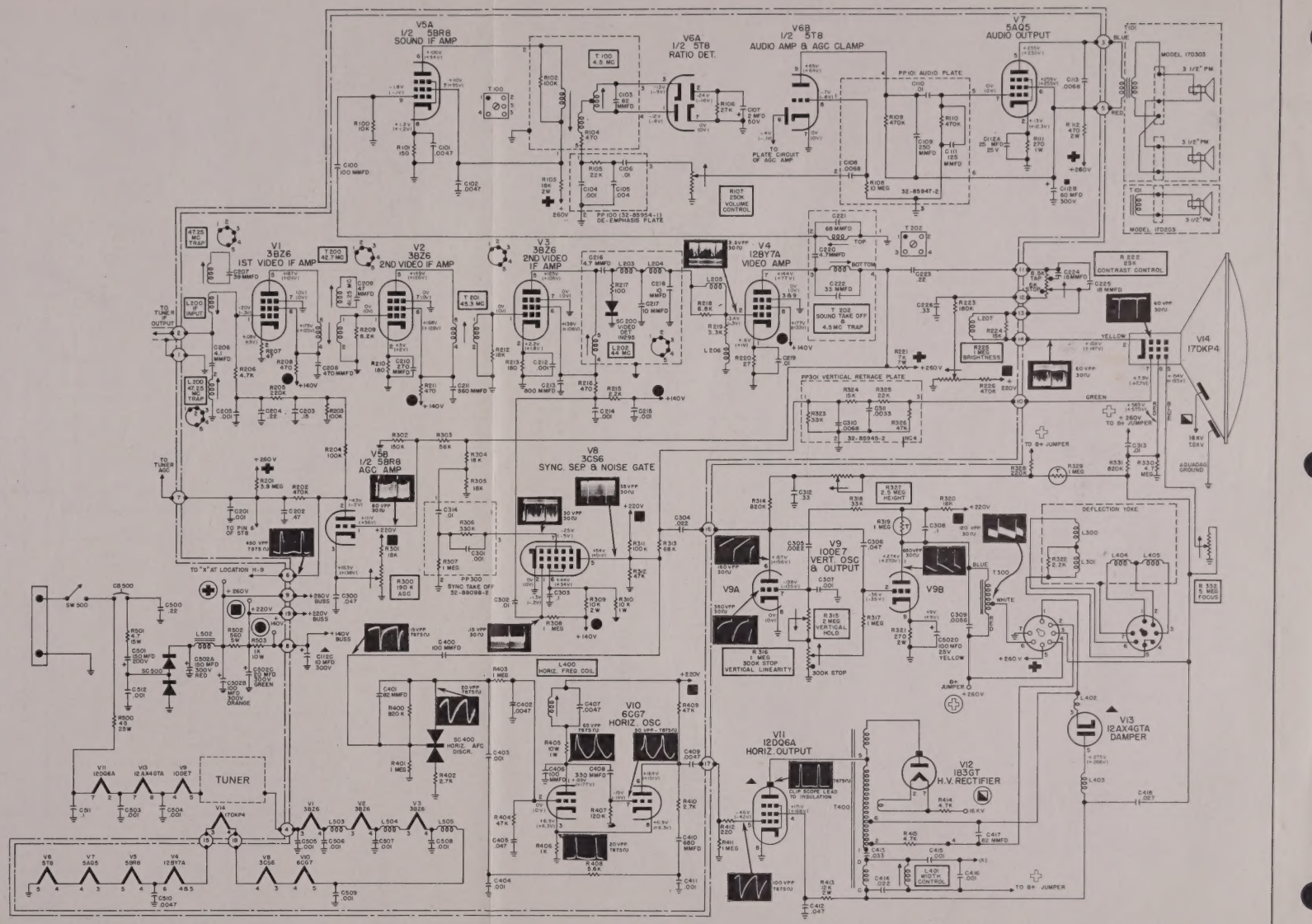
1. Channel selector set to strong channel.
2. Contrast control set for signal of 60V. PP at yellow lead of picture tube.
3. Waveforms measured with respect to chassis using Sylvania type 404 oscilloscope. (Other type oscilloscopes may alter waveform shapes or amplitudes).
4. The terms "30VPP" or "7875PU" refer to scope sweep frequency used.

GENERAL SCHEMATIC NOTES

1. Voltage sources are indicated by encircled symbols: corresponding symbols without circles indicate voltage tie points. Actual output of +140V. supply may vary from 130V. to +180V. depending on incoming signal strength.
2. Average resistances of coils and transformers are shown and are measured with component connected in circuit.
3. Encircled numbers on edge of printed circuit indicate tie points corresponding with those shown on parts layout of top board.
4. All capacitors are rated in microfarads unless otherwise specified.
5. Coil and transformer terminal views are shown as seen from bottom.
6. Arrows on controls indicate direction of clockwise rotation.
7. Schematic coordinates are for reference in locating components, for example, R102 located in coordinates A-5.

PARTS CODING

Tuner Section	1-99
Sound Section	100-199
Video Section	200-299
Vert. & Sync Section	300-399
Horiz. & HV Section	400-499
L.V. Supply, Fil, Halo	500-599



SYLVANIA MODELS 17D203Q, QU, 17D303S, SU, 17D303T, TU (Ch. 1-543-1, -2)

Schematic Diagram Courtesy of SYLVANIA ELECTRONICS PRODUCTS INC

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